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GENERAL PRACTICE SERIES

THE ADRENAL GLANDS*

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and

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The adrenal cortex, which is largely under control of the pituitary adrenocorticotrophic hormone (ACTH) produces 3 main groups of hormones:

1. *Glucocorticoids*. These are the cortisone- or hydrocortisone-like hormones which have an anti-inflammatory and anti-allergic action which has provided them with rich clinical applications. Their name derives from their stimulation of gluconeogenesis with a tendency to produce a diabetic state. As side-effects these steroid hormones can reproduce all the features of Cushing's syndrome.

2. *Mineralocorticoids*, which exert a salt-and-water-retaining effect. Desoxycorticosterone (DOCA) is a synthetic member of this group. The newly-recognized hormone aldosterone is the most powerful mineralocorticoid yet isolated. It is not yet clear to what extent the pituitary gland mediates its production, but probably this is only slight.

3. *Sex Hormones*. The most important of these is androgen.

PHARMACEUTICAL PREPARATIONS

ACTH or Corticotrophin is the 'parent' hormone and may be given by injection to stimulate the patient's adrenal gland to greater production of its own steroid hormones. The average dose of ACTH in most clinical disease states lies between 50 and 100 units daily in 3 or 4 divided intramuscular doses. Maintenance doses vary from 20 to 40 units. Recently gel preparations of ACTH have been available, which require one or two injections daily. Preparations of ACTH-Z are claimed to last up to 48 hours in some cases and smaller doses seem to suffice. The use of larger doses is quite unnecessary, for no further stimulation of the adrenal cortex can take place. Actually there is very little place for ACTH in therapy; claims of its superiority over steroid hormone are of doubtful validity, and occasionally it produces severe anaphylactic reactions.

Other preparations replace the patients own adrenal hormones or supplement them. Their chief advantage lies in ease of administration, since they may be given orally.

Cortisone is usually given in a 'loading' dose of 300 mg. daily (in divided doses); an average maintenance dose is 37·5-100 mg. daily. Cortisone is also available for parenteral administration. It is thought to be converted in the body to *hydrocortisone*, which is the major glucocorticoid produced by the adrenal gland. Hydrocortisone is also available for clinical use, equivalent doses being 240 mg. daily initially and 30-80 mg. daily as maintenance.

Prednisone and *prednisolone* are recent synthetic derivatives of these two hormones, which appear to have greater anti-inflammatory, but lesser salt-retaining, effects. These special properties are of distinct therapeutic advantage. An average loading dose is 60 mg. daily, maintenance daily doses ranging from 5-20 mg. Several new compounds are being investigated, and promise greater safety and specificity of action.

Desoxycorticosterone acetate ((DOCA, DCA) still has a limited place in the treatment of adrenocortical insufficiency by reason of its strong salt-retaining effect. Occasionally in Addison's disease or after adrenalectomy it is necessary to add this preparation to the customary cortisone maintenance.

Whole extracts of adrenal cortex have no longer any place in medical management.

Side-effects of these Preparations

Because of their side-effects these preparations should not be used indiscriminately. Where treatment is instituted, careful appraisal is needed for the development of the following:

1. *Infections*, notably tuberculosis.
2. *Glycosuria or frank diabetes.*
3. *Peptic ulceration, haemorrhage or perforation.* The

* This is the 4th article in a series of 5 on endocrine disturbances by the same authors which are appearing weekly.

signs of the latter may be masked during the administration of these steroids.

These complications may develop very early in the course of treatment.

4. *Mental changes*, often slight, occasionally severe psychoses.

5. *Osteoporosis* with fractured vertebrae as a major complication.

6. *Hypertension and congestive cardiac failure.*

7. *'Cushingoid' appearance.*

Contra-indications include acute psychoses, acute peptic ulcer, hypertension, bleeding states or active or latent tuberculosis. Many authorities permit steroid therapy in the face of the last mentioned, provided adequate anti-tuberculous therapy is given simultaneously.

Patients on long-term maintenance cortisone therapy need special attention at times of stress e.g. infections and operations. The dose of steroid should be doubled over these periods and should then gradually be reduced to the previous maintenance levels. When long-term steroid treatment is to be discontinued, particular care must be exercised to avoid 'withdrawal' symptoms. During steroid therapy, the patient's own adrenal glands become inactive and atrophic. If this therapy is stopped abruptly, the patient's glands may be incapable of resuming adequate function and the patient may enter a phase of acute adrenocortical insufficiency. In order to obviate this the dose of steroid hormone should be tailed off gradually and injections of ACTH should be given to stimulate endogenous hormone production by the previously inert adrenal glands.

Patients in hypo-adrenal states, therefore include (1) Addison's disease, (2) post-adrenalectomy, (3) 'recovery' phase after prolonged steroid therapy. In these states it is particularly important to restart or to increase steroid hormones in times of stress (notably infection, operation, or even severe emotional strain).

CLINICAL SYNDROMES RESULTING FROM ADRENAL DYSFUNCTION

1. *Cushing's Syndrome* (i.e. 'natural' hyperadrenocorticism with respect to cortisone production) is a rare condition; the coexistence of diabetes, obesity and hypertension is common but very few of these patients can be shown to have measurable adrenocortical overaction.

Specialized investigation is indicated where this triad is accompanied by weakness and wasting of muscles, purple striae, easy bruising, amenorrhoea or marked osteoporosis. Virilization is not a feature of Cushing's syndrome although mild facial hirsuties may be present. It should be noted that this clinical picture can be reproduced fully by exogenous cortisone administration.

2. *Addison's Disease* in this country is commonly due to tuberculous involvement of the adrenal glands. Patients with active tuberculosis should be watched lest they insiduously manifest this disease.

The full clinical picture of Addison's Disease includes loss of weight, asthenia, pigmentation, hypotension and crises of gastro-intestinal disturbance. Pigmentation is brown in colour and affects exposed parts, pressure areas (e.g. belt and shoulder-strap regions), the palmar creases, nipples, axillae and scars. Characteristically the mucous membranes are also pigmented—a feature which distinguishes this disease from many other causes of pigmentation. Unfortunately oral pigmentation is found not uncommonly in normal members of the coloured races, so that this diagnostic feature is not of much value in them.

One must remember Addison's Disease in those patients who complain simply of asthenia or loss of weight, since the full clinical picture is not always present.

3. *Phaechromocytoma* is a rare tumour arising from the adrenal medulla. It secretes an adrenaline-like substance which might give rise to hypertension. Its presence should be suspected where there is intermittent or paroxysmal hypertension with associated features of palpitation, tremor, sweating, headache, nausea, vomiting, diarrhoea or other features of excessive adrenaline action. Definitive diagnosis requires specialized laboratory tests, but a screening test with phentolamine is often helpful. This is performed by intravenous injection of 5 mg. of phentolamine (Rogitine, Regitine). Blood-pressure readings are taken repeatedly thereafter. A drop in systolic / diastolic pressures of 35/25 mm. Hg. is suggestive of phaeochromocytoma, but false positive results are sometimes obtained.

4. *Congenital Adrenal Hyperplasia* may give rise in the female to a form of pseudo-hermaphroditism with precocious somatosexual development. In both sexes it may be associated with crises of adrenal insufficiency.

5. *'Simple' Hirsutism*

Some women develop striking hirsuties, usually in the adolescent years. This is generally most marked on the face, but may also affect the abdomen and chest. There is frequently a familial incidence. Other signs of verilization are absent—menstruation may be normal, breasts not atrophic, clitoris not enlarged and body contours femininely rounded. In these unfortunate women, *no* endocrine abnormality is apparent and no endocrine therapy avails. Local depilatory measures should be advised.

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VAN DIE REDAKSIE

AKUTE LEUKEMIE

Vir meer as 'n volle eeu nadat Rudolf Virchow vir die eerste maal die naam ‚leukemie' aan sy gevalle van *Weisses Blut* gegee het, het dit die verbeelding van die mensdom aangegryp. Leke word altyd geboei deur die verhaal van die Skone en die Gedrog—in hierdie geval jeug wat deur 'n noodlottige siekte geteister word—en daar is baie min takke van die wetenskap wat nie by die soektog na 'n bevredigende geneesmiddel betrokke was nie. Inderdaad, leukemie het nog nooit opgehou om die wetenskaplike se aandag aan te gryp nie. As die konsentrasiepunt van hematologie, het dit onlangs egter 'n nuwe belangrikheid aangeneem aangesien die toename in voorkoms daarvan gedurende die afgelope 25 jaar slegs deur kroonslagaartrombose en longkanker oortref is. In 1931 is dit gesertifiseer dat 685 persone in Engeland en Wallis aan leukemie gesterf het: in 1955 was die getal 2,224—'n drievoudige toename in voorkoms. Terselfdertyd het die spits van sterfgevalle daardeur veroorsaak, na ouer mense verskuif (45-75). Dit skyn of die siekte meer dikwels by stedelinge as by plattelanders voorkom, meer dikwels by die rykes as by die armes, meer dikwels—in Amerika in elk geval—by blankes as by nie-blankes.

By hersiening van 'n reeks van 570 gevalle en by bespreking van die huidige begrip van die siekte, het R. Bodley Scott onlangs verklaar dat dit tans, deur middel van nuwer metodes, moontlik is om die mees akute gang van leukemie vir 'n rukkie te stuit.[1] Alhoewel hierdie aanspraak glad nie nuut is nie, kan 'n klein bietjie aanmoediging geput word uit Scott se samevatting in die 1957-Lettsomiaanse lesing oor die jongste vooruitgang op die gebied van leukemie. Dit bly nog, sê hy, 'n hardnekkig noodlottige siekte. Afgesien van die metode van behandeling, sterf die meeste gevalle binne 2 jaar nadat die siekte gediagnoseer is. Hierdie neerdrukkende vooruitsig is geneig om pogings om 'n afname in die siekte te verkry, te ontmoedig; soos almal weet, is hierdie afname altyd net van kortstondige duur. Scott veroordeel egter ten sterkste die nihilistiese benadering as 'n onverdedigbare standpunt; behalwe dat dit 'n ondeurdringbare versperring in die weg van terapeutiese vooruitgang plaas, ontmoedig dit die pasiënt en almal wat met hom te doen het, insluitend sy geneesheer. ‚Selfs 'n paar maande langer om te lewe mag van ontskatbare waarde wees, en dit is die internis se plig om alles in sy vermoë te doen om hierdie tydelike verposing te bewerkstellig.'

Simptomatiese behandeling is waarskynlik nog die internis se beste beleid. In Scott se reeks het 81 gevalle wat simptomaties behandel is, vir 20·2 weke gelewe na die eerste simptome verskyn het, terwyl 63 gevalle, wat bykomende spesifieke preparate (hieronder bespreek) gekry het, vir

EDITORIAL

ACUTE LEUKAEMIA

For the full century or more since Rudolf Virchow first gave the name 'leukaemia' to his cases of *Weisses Blut* the disease has held the fascination of mankind. Lay people are ever drawn by the tale of Beauty and the Beast—in this case youth being mortally afflicted by a fatal disease—and few branches of science have not been involved in the search for a satisfactory remedy. In truth, leukaemia has never ceased to evoke the scientist's attention. Yet recently it has been elevated to a new importance, as the focal point of haematology, for only coronary thrombosis and carcinoma of the lung have exceeded its rise in incidence over the last 25 years. In 1931 685 persons were certified as dying of leukaemia in England and Wales: in 1955 the figure was 2,224—a threefold increase in incidence. At the same time the peak of deaths from it has shifted to older people (45-75). The disease appears to occur more in urban than in rural dwellers, more in the rich than in the poor, more—in America, at any rate—in Whites than in non-Whites.

In reviewing a series of 570 cases and discussing the present understanding of the disease, R. Bodley Scott recently stated that it was now possible, by newer methods, to halt for a while the most acute course of leukaemia.[1] While this claim is by no means new a little encouragement may be taken from Scott's outline in the 1957 Lettsomian lecture of the current therapeutic advances in leukaemia. It remains, he says, a stubbornly fatal condition. Most cases are dead within 2 years of diagnosis, irrespective of the method of treatment. This depressing outcome tends to discourage attempts to procure a remission which all know can never be more than transient. However, Scott vigorously attacks the nihilistic approach as an indefensible standpoint; apart from erecting an impenetrable barrier against therapeutic advance, it demoralizes the patient and all around him, including his medical attendant. 'Even a few more months of life may be immeasurably precious, and it is the physician's duty to do all that is possible to procure this temporary reprieve.'

Symptomatic treatment is still probably the physician's best line. In Scott's series, 81 cases treated symptomatically survived for 20·2 weeks after the first symptom appeared, while 63 cases receiving additional specific preparations

21·7 weke gelewe het. Daar is dus geen rede om optimisties te wees oor hierdie preparate nie, alhoewel Scott waarsku dat hulle nie té ligtelik buite rekening gelaat moet word nie. Die simptomatiese maatreëls word op die beheer van ontstekings en die hemorragiese toestand toegespits. Bloedvergiftiging kom dikwels voor en lokale infeksie van die mond (gewoonlik moniliaal van aard) vereis flinke behandeling met geskikte antibiotika. Weens die hemorragiese neiging behoort hulle egter nie as 'n roetine of voorbehoedende maatreël gebruik te word nie. Die gevaar wat hierdie kenmerk inhou, word getoon deur die feit dat 23 uit 55 pasiënte aan bloeding gesterf het, 14 daarvan aan die binneskedel-soort. Dit is aan die hand gedoen dat die finale noodlottige voorval, na daar vir maande geen bloeding was nie, deur 'n fibrolisien of sirkulerende teenstollingstof, as gevolg van 'n bykomende infeksie, veroorsaak word. Bloedoortapping is nuttig om bloedarmoede te verlig, maar slaag nie daarin om die neiging tot bloeding te beheer nie—bloedplaatjie-oortapping mag van meer nut hiervoor wees, alhoewel die voordeel daaraan verbonde van verbygaande aard is. Dit lyk of bloedoortappings, indien dit intelligent en doelbewus gebruik word, tans die hematoloog se waardevolste wapen is om die leukemiese pasiënt aan die lewe te hou.

Spesifieke middels wat 'n gunstige wending aan die toestand kan verleen, al is dit tydelik, sluit in kortisoon en verskeie antimetaboliete. Kortisoon is vir die eerste keer in 1950 gebruik en dit is bevind dat 'n afname in die siekte (van 6 weke of langer) by ongeveer die helfte van die gevalle verkry kan word. Algehele afname kan by kinders met limfoblastiese leukemie en soms by volwassenes verwag word; die ander seltipes reageer nie so goed nie. Die antimetaboliete wat gebruik word, is dié wat die sintese van nukleïensuur in die liggaam belemmer. Die foliensuurteenwerkers het terapeuties in onbruik geraak, maar hulle het spesifieke heilsame waarde by die behandeling van akute limfoblastiese leukemie by kinders, waar afname van die siekte deur hulle gebruik verkry kan word. Die purien-teenwerkers, waarvan 6-merkaptopurien tans die gewildste is, word meer algemeen gebruik. In Scott se reeks het ongeveer een-derde van die kinders en een-sewende van die volwassenes wat met hierdie stof behandel is, afname van die siekte, wat gemiddeld 3 maande geduur het, getoon. Die aard van die sitologiese soort van die leukemie was van minder belang by die prognose as wat dit by die behandeling met foliensuur was.

Greig *et al.*,[3] in 'n studie van die gebruik van 6-merkaptopurien by akute leukemie, wat hulle in 'n referaat by die laaste Suid-Afrikaanse Mediese Kongres (Pretoria, 1955) aangebied het, het tot die gevolgtrekking gekom dat hierdie purien-teenwerker wel van nut is by die behandeling van akute leukemie (asook by die akute eindstadium van chroniese murgleukemie en by monoblastiese en miëloblastiese leukemie), maar dat die uitwerking daarvan nie altyd dieselfde was nie. Hulle het gevind, dat by die gevalle wat daardeur gebaat het, die smartlike simptome van akute leukemie versag was, en die einde, toe dit aangebreek het, genadig was, daar dit so skielik en soms onverwags gekom het.

1. Scott, R. B. (1957): Lancet, **1**, 1053.
2. Freeman, G. (1952): Blood, **7**, 235.
3. Greig, H. B. W., Metz, J., Laird, M. J., Zentkowsky, D. en Fitzpatrick, M. M. F. (1956): S. Afr. T. Geneesk., **30**, 360.

(discussed below) survived for 21·7 weeks. So there is no cause to be optimistic over these preparations, although Scott warns that they should not be too lightly discounted. The symptomatic measures are directed at controlling infections and the haemorrhagic state. Septicaemia is frequent, and local infection of the mouth (usually monilial in nature) requires brisk treatment with appropriate antibiotics. But these should not be used as a routine or prophylactic measure because of the haemorrhagic tendency. The danger of this feature is shown by the fact that 23 out of 55 patients died of haemorrhage, 14 of the intracranial type. It has been suggested that the final fatal episode, after months of freedom from bleeding, is brought about by a fibrolysin or circulating anticoagulant resulting from a superimposed infection.[2] Blood transfusion is useful in relieving anaemia but fails to control the bleeding tendency—for this, platelet transfusion may be more useful, although its benefit is transient. Intelligently and purposively used, blood transfusion seems at present to be the haematologist's most valuable weapon in keeping the leukaemic patient alive.

Specific agents that can alter the picture for the better, albeit temporarily, include cortisone and several antimetabolites. Cortisone was first used in 1950 and it is found that remission (for 6 weeks or more) can be obtained in about half the cases. Complete remission can be expected in children with lymphoblastic leukaemia and sometimes in adults; the other cell-types do not respond so favourably. The antimetabolites used are those that interfere with the synthesis of nucleic acid in the body. The folic-acid antagonists have now fallen by the therapeutic wayside but they have a specific beneficial value in the treatment of acute lymphoblastic leukaemia in children, where remissions can be obtained by their use. The purine antagonists, of which 6-mercaptopurine has current vogue, are in more general use. In Scott's series about one-third of the children and one-seventh of the adults treated with this substance showed remissions lasting on an average 3 months. The nature of the cytological variety of the leukaemia was less important in the prognosis than it was with folic-acid therapy.

Greig *et al.*,[3] in a study on the use of 6-mercaptopurine in acute leukaemia presented in a paper at the last South African Medical Congress (Pretoria, 1955) concluded that this purine antagonist had a place in the treatment of acute leukaemia (as well as in the acute terminal phase of chronic myelogenous leukemia and in monoblastic and myeloblastic leukaemia) but that it was inconstant in its action. They found that in the cases which benefited the very distressing symptoms of acute leukaemia were mitigated, and the end, when it came, was merciful in being very sudden and sometimes unexpected.

1. Scott, R. B. (1957): Lancet, **1**, 1053.
2. Freeman, G. (1952): Blood, **7**, 235.
3. Greig, H. B. W., Metz, J., Laird, M. J., Zentkowsky, D. and Fitzpatrick, M. M. F. (1956): S. Afr. Med. J., **30**, 360.

MICRODISSECTION OF THE KIDNEY

Microdissection of the kidney allows the scientist to study the nephron in three dimensions throughout the length of each unit and to localize the exact position of pathological lesions. The findings may be correlated with biochemical changes in the patient. Oliver published a classical monograph on the architecture of the kidney in chronic Bright's disease in 1939[1] but new techniques and findings have been reported since then. A recent paper by Darmady and Stranack deals with a study of the nephron by microdissection in a number of conditions,[2] and details are also given of the technique of maceration and of the preparation of an isolated nephron or tubule for study and photography.

In an examination of 53 preparations from persons who had died of anuria caused by a number of aetiological factors but not by known nephrotoxic agents, the microdissection method revealed that in the 'onset phase' (lasting up to 36 hours) many nephrons had focal points of disarrangement of the tubular epithelium and loss of translucency. During the early stages of oliguria or anuria, microdissection once more showed the disarrangement of the tubular epithelium and focal necrosis in varying degree in different nephrons, with certain other changes also present. Ruptures of the tubular wall in all parts of the nephron appear about the middle of the anuric phase, and casts are seen in the lumen in various parts of the nephron, particularly in the lower part, as the disease progresses. In the diuretic phase there is evidence of regeneration, the epithelial pattern of the proximal tubule becoming regular before the distal and collecting tubules. Microdissection clearly shows that there is random distribution of the lesions; some tubules may show rupture of the walls, some may contain multiple casts, while some nephrons may apparently escape.

In 11 cases of Lignac-Fanconi disease (cystinosis) microdissection revealed a structural defect in the renal tubule. In specimens from 8 subjects the proximal tubule was shorter than normal, the first part being replaced by a thin and narrow neck (swan neck); in the 3 others it was also narrower and shorter than normal (hypotrophic).

Examination of biopsy specimens of the kidneys of patients with hyperaldosteronism (Conn's disease) by a number of workers has shown widespread vacuolation of the tubular epithelium. Darmady and Stranack[2] also found intense vacuolation of the renal epithelium, particularly in the proximal but also in the distal tubule, in 4 patients with potassium deficiency (2 associated with an adrenal adenoma and an adrenal carcinoma respectively, and 2 who were cases of Cushing's syndrome with potassium depletion); the vacuolation was not dependent on an increase in the circulating adrenocortical steroids since potassium depletion can apparently alone produce such changes.

Microdissection overcomes certain difficulties and helps to clarify some of the problems encountered in the study of renal pathology.

1. Oliver, J. (1939): *Architecture of the kidney in chronic Bright's disease*. New York: Hoeber.
2. Darmady, E. M. and Stranack, F. (1957): Brit. Med. Bull., **13**, 21.

THE HISTORY OF PNEUMOCONIOSIS

A BRIEF REVIEW*

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The history of mining goes far back into antiquity. In prehistoric times men mined for salt, flint and ochre. Neolithic man seemed to have discovered that he could work freshly-mined flint, before it lost its water, much more easily than flint found on the surface, and perhaps that is why flint mines were found where flints are also found near or on the surface. E. L. Collis has suggested that the neolithic miner may have suffered from silicosis. The fact is that in at least two prehistoric bodies signs of pneumoconiosis were found and that signs of the disease were found in a number of Egyptian mummies. Collis' suggestion, in his 1915 Milroy lectures, that silicosis is the most ancient industrial disease, therefore rests on strong grounds.

In the days of Roman and Greek greatness metalliferous mining was conducted on a large scale, and the conditions were extremely hazardous and onerous. It appears that usually only the lowest type of slaves were employed. Justinian remarks that condemnation to mining is almost as severe as the death penalty, thus '*proxima morti poena metalli coercitio*'. There are many references in Roman and Greek writings to the arduous conditions and dangers of mining, particularly of silver and gold.

The earliest reference to protection against inhalation of dust is in Pliny's *Natural History*. He records that some miners used bladder skins to cover their mouths. Julius Pollux (124-192 A.D.) confirms this, and also refers to the use of bags for the same purpose (Legge, *Industrial Medicine*, 1936).

Agricola and Paracelsus

The dark age descended upon Europe, and it is only during the 16th century that we again find records of miners' diseases. Agricola and Paracelsus are our informants. Paracelsus, whose real name was Theophrastus Bombastus von Hohenheim, published his *Von der Bergsucht und anderen Bergkrankheiten* in 1534, and Agricola his *De re metallica* in 1556. Agricola, whose real name was Georg

* A lecture delivered to members of the South African Institute for Medical Research and the Pneumoconiosis Bureau, Johannesburg, 27 April 1957.

Bauer, was a physician, not an engineer, although his monumental work covers every phase of mining. At the age of 32, and for his time a highly educated man, he was appointed city physician at Joachimstal, on the Bohemian side of the Erzgebirge, situated in the middle of a flourishing silver-mining area. Agricola made a remarkably thorough study of every aspect of the mining in this area, and at the same time read widely on the subject in the Greek and Latin classics. In the preface to his book he remarks: 'I have omitted all those things which I have not myself seen, or have not read, or heard from persons upon whom I can rely.' We may accept his descriptions, and particularly those of diseases, as being entirely trustworthy.

It is interesting to note that in those mines, in Agricola's time, the working hours were 7 hours a day on 5 days a week. There were generally 3 7-hour shifts in the 24 hours, the remaining 3 hours being used in entering and leaving the workings. The night shift, which ran from 8 p.m. to 3 a.m., was only permitted by the authorities when there was pressing necessity. But Agricola also records that, while in some mines the miners are not allowed to work two successive shifts, it is allowed in other mines '. . . because he (the miner) cannot subsist on the pay of one shift as provisions grow dearer.' So the problem of 'cost structure' seems to have existed even 400 years ago!

It is Agricola's 6th book of *De re metallica* that is of special interest for our present purpose. In this he describes the diseases and accidents he observed among the miners. Especially interesting for us is his description of pulmonary diseases. He speaks of a disease of the lungs which produced 'suppuration' of the lung tissues, associated with emaciation. He recognized the role of dust in producing this disease, which seemed to have been very common and to have a high mortality. He, for instance, records that there were women who had married seven husbands 'all of whom this terrible consumption has carried off to a premature death'. He advised the use of respirators and efficient ventilation. Thus: 'On the other hand some mines are so dry that they are entirely devoid of water, and this dryness causes the workmen even greater harm, for the dust, which is stirred and beaten up by digging, penetrates into the windpipe and lungs and produces difficulty in breathing and the disease the Greeks named "Asthma". If the dust has corrosive qualities, it eats away the lungs . . .'

Paracelsus was a contemporary of Agricola. The son of a Swiss physician of a noble family, he was a great traveller and a man of independent ideas—a reformer by nature. He early revolted against the orthodox tenets accepted in medicine, basing his teaching not on the dicta of the ancients but on his own experience. As is usual, his heterodoxy gave rise to opposition from his conservative-minded colleagues, and later to frank persecution. He was forced out of Germany and wandered as far as Scandinavia. But his very misfortunes gave him opportunities for wide study and experience. Among these was the study of miners' diseases in Sweden, Denmark, Hungary and other parts. He appears not to have had any previous knowledge of miners' diseases, and therefore records only personal observations. These are not of any importance as regards silicosis, although very interesting to the student of the evolution of medical thought. The sole reason for mentioning Paracelsus is that he was seemingly the first European physician to recognize that the ailments of miners were occupational, for he states '. . . we must also have gold and silver, also other metals, iron, tin, copper, lead and mercury. If we wish to have these, we must risk both life and body . . .' That was an important step forward.

Seventeenth Century

In the 17th century several monographs appeared on miners' diseases, and among these a popular book for the guidance of miners by Martin Pansa, in which he speaks of mineral particles being deposited 'on the walls of the lungs'. There was also one by Stockhausen in which he defines 'Bergsucht' as a disease in which there is '. . . difficult breathing and short-windedness, together with a severe hard cough and marked hoarseness. Such affections commonly degenerate into a consumption and kill the individual'. (Legge, *op. cit.*). This is a recognizable description of pneumoconiosis. He also records that very large quantities of dust were created in calcining rock to enable easier breaking, and also in powder blasting. It was in this century that the Father of Industrial Hygiene, Bernardino Ramazzini, was born and made his great contribution to this subject. He recognized the existence of a miners' lung disease and advised respirators and ventilation.

Nineteenth Century

Throughout the 18th and 19th centuries the various diseases to which miners were especially prone were studied and written about. Thus Thomas Beddoes, in an essay published in 1799, remarks that inhalation of dust may lead to pulmonary consumption.

An important publication in 1832 was *The Effects of Arts, Trades and Professional and Civic States and Habits of Living on Health and Longevity* by Dr. Charles Turner Thackrah of Leeds. It was the first book in English, by an Englishman, on industrial medicine. To us it is of interest because Thackrah's book gives the first definite information on the mortality and morbidity of British miners. In it is the first mention of what was later recognized as miners' nystagmus. He pointed out that work is dangerous in sandstone, but not in limestone. The following is a significant passage in explanation of this difference in hazard: '. . . that the latter (limestone) is full of vertical and other fissures, which allow the superincumbent beds of water to percolate through the roof of the mine; whilst the sandstone strata, which are impervious to water, preserve the mine quite dry; consequently the minute particles of rock formed by blasting or the pickaxe are kept in a dry state within the sandstone mine, forming as it were an atmosphere of dust which the miner is constantly inhaling. In the limestone mine the particles, on the contrary, are laid as they are formed by the constant oozing, dropping and splashing of the insinuating water.' He states that the conditions were so bad that even though miners worked only a 6-hour day few survived beyond the age of 40, the deaths being chiefly due to affections of the lungs and bowels. So far as I can ascertain, Thackrah was the first te mention the special danger of sandstone.

For South African miners particular interest attaches to Farr's analysis of the mortality of Cornish metal miners (W. Farr, *Mortality of Miners*, 1843-53 and 1860-62: *Vital statistics*, 1885). In brief, Farr showed that until the age of 35 there was a marked progressive increase of the death rate among the miners, rising from about a 50% excess in the age-group 35-45, to over double in the age-group 45-55,

over treble in the group 55-65, and over double in the group 65-75. He also showed that deaths from pulmonary diseases, whilst nearly the same for miners and non-miners in Cornwall in the age-groups 15-25 and 25-35, rapidly rise to nearly double in the 35-45 group, to nearly 5 times in the 45-55 group, to over 8 times in the 55-65 group, and to about 5 times in the 65-75 group. From these data Farr justifiably concluded that pulmonary diseases resulting from the conditions incident to mining are the chief causes of the high mortality.

The importance of these findings to South Africa lies in that many of the earlier miners in the South African gold mines came from Cornwall, after having worked for varying periods in the mines there. Many of these succumbed to silicosis with and without tuberculosis after relatively short periods of work in South Africa. Farr's statistical analysis is paralleled by other statistics published up to the end of the 19th century, and his main contention is, of course, now placed beyond doubt; that is to say, that there is a high mortality associated with mining in hard rock.

Greenhow

The demonstration that silica is the most important harmful dust originated with Dr. E. H. Greenhow, the first medical inspector of factories in England, who in 1864 identified particles of silica in the lungs of grinders by the use of polarized light. He was probably the first to use polarized light for this purpose.

In concluding this section, it may be of interest to say that the introduction of the term 'silicosis' is ascribed to an Italian named Visconti by another Italian, Rovida, who in 1871 published a paper on a case of silicosis. The term 'pneumonokoniosis' was introduced by Zenker. It is now generally abbreviated to 'pneumoconiosis'.

SILICOSIS IN SOUTH AFRICA

In their paper presented before the International Conference on Silicosis, held in Johannesburg in August 1930, Drs. L. G. Irvine, A. Mavrogordato and Hans Pirow divided the history of silicosis on the Witwatersrand mines into 4 periods:

1. The initial period of gold mining on the Rand, from 1886 to 1899, i.e. from the date of the first discovery of the reef until the outbreak of the South African War. One may fairly call this period, so far as local conditions are concerned, a period of ignorance of the dangers of silicosis.

2. The period of first realization of the menace of silicosis and of tentative preventive measures, from 1901 to 1910.

3. The period of the introduction of a legal system of compensation for the disease, and of the trial of more systematic preventive measures, from 1911 to 1916.

4. Finally, what one may call the 'present-day' system of fully systematized measures of prevention, detection and compensation, from 1916 to the present time.

The last period can be taken as still continuing.

In the late 1880s, after the discovery of gold on the Witwatersrand, there was scepticism about the future; the lay-out of the mines was rather primitive and proved a handicap for the deep-level workings which had to be undertaken in the late '90s, when the true value of the deeper deposits was more fully appreciated. Until then a number of workings were open-cast, and the underground mines, such as they were, were in oxidized and comparatively soft and friable ground. Most drilling was done by hand; the dust was consequently of large size and probably of low silica ratio, and the miners were thus exposed to relatively low hazard from dust. Most miners were immigrants from Europe with previous mining experience, and a large proportion were Cornishmen. In about the middle '90s the oxidized zone was passed. The dry drilling, which now was done by machine as well as by hand, and the blasting, created a great deal of dangerous dust. The 'cut' and 'round' were blasted separately during the shift, at all hours, and men returned to face into clouds of dust and fumes. The danger was not fully realized. It was only after the South African War, in 1901, that the menace was pointed out in the Transvaal Government Mining Engineer's report for the 6 months ending December 1901. He recorded that, of 1,377 machine men employed before the war, 255 were known to have died between October 1899 and January 1902.

In December 1902 Lord Milner appointed a '*Miners' Phthisis Commission*', which issued a report in 1903. They could only examine 1,201 miners, for many refused to be examined; of this number 15·4% were found to be suffering from miners' phthisis, and another 7·3% were considered suspect. The rate was probably higher, for it is reasonable to assume that among those who refused examination there was a larger ratio of miners' phthisis cases. On the one hand, many of the sufferers had probably started their disease in Cornwall. On the other hand, Haldane, Martin and Thomas, in their 1904 report on Cornish miners, state that many of the deaths of Cornish miners were among men who had worked on the Witwatersrand. The Transvaal Commission found that among those rock-drill miners who worked only in the Transvaal the average working period before becoming affected by phthisis was under 6 years. The Haldane report states that Cornish miners who worked only in the Transvaal contracted the disease in an average of 4·7 years.

In 1905 regulations were issued aimed at the suppression of dust. The slogan of the time was: 'Dry mining must, as far as possible, become wet mining.' The regulations provided that sprays or water jets were to be used with machine drills: that broken ground was to be damped down and that men should not be allowed in workings until the air was cleared after blasting. There were also regulations designed to provide more efficient ventilation. Unfortunately these regulations were not carried out with the necessary thoroughness, largely because of the conservatism of the miners, although considerable improvement was effected. The danger of blasting dust was not appreciated, and nothing much was done to control it.

A *second Commission* was appointed in 1907. Its report was issued in 1910. Evidence given by Drs. Macaulay and Irvine before this Commission shows that in the period 1905-07 the mortality rate among miners was sixfold that of other adult males on the Witwatersrand.

As a result of the Commission's recommendations, *new regulations* were issued. Among the important new provisions were: That a water-blast was to be used to control dust from blasting: improved ventilation standards: and the placing of the responsibility on underground officials for the carrying out of preventive measures. The effect of these measures, backed probably by more general appreciation

of their importance and of the real menace of silicosis, is reflected in the dust content of the air of a typical mine sampled at the bottom of an upcast shaft. In September 1911 it varied during the period from 9 a.m. to 5.15 p.m. between 80 mg. and 280 mg. per cubic metre; in April 1912 it was between 14 and 39, and in September 1912 between 0·2 and 17·1. Sprays were used in the last two periods and not in the first.

At the close of 1910, 84 mines on the Witwatersrand employed over 10,000 Europeans and 120,000 Natives; they worked 5,500 'dry' rock-drills at a maximum depth of 4,500 feet and an average stoping depth of 1,100 feet, and hoisted 27,000,000 tons of rock in the year.

In 1911 *a Commission* was appointed, consisting entirely of medical men, to enquire into the prevalence of miners' phthisis and tuberculosis on the mines, and to advise from the medical point of view on compensation. The Commission medically examined 3,163 miners; 326 were radiologically examined by the late Dr. A. H. Watt. This was the first time that radiological examination was used on such a scale for the diagnosis of silicosis. They found definite disease in about 26% and doubtful disease in an additional 5·5%. The average duration of work of those affected was 8·2 years. For men on rock drills it was only 6·1 years.

Miners' Phthisis Act

On the basis of this Commission's report, the 1912 Miners' Phthisis Act was passed. This, the first Act providing compensation for miners' phthisis, was followed by a long series of amending and consolidating legislation, culminating in the 1956 Act.

The 1912 Act provided for the contribution by miners of 2½% of their wages to the compensation fund for silicosis. The compensation was limited to a maximum total in each of the two stages of miners' phthisis defined in the Act. All these provisions were profoundly modified by subsequent legislation, which progressively prescribed higher rates of compensation, widened the scope of entitlement to it, and abolished contributions by the miners.

The medical examination before employment, and for benefits, was carried out by a panel of medical practitioners in the case of Europeans and the Mines' Medical Inspector in the case of Natives. The panel system not only resulted in great lack of uniformity in the standards of certification for fitness to work underground and entitlement to compensation, but also in a substantial number of fraudulent claims, mostly by substitution.

During the period 1912-16, 6,472 European miners were awarded compensation, and of these 3,235 were certified as being in the 'second stage', which was defined as 'a miner who has contracted silicosis in a marked degree, and whose physical capacity for underground work is thereby seriously and permanently impaired'. It was the opinion at the time that the 'production rate' was about 900 cases a year among the approximately 10,000 miners—compared with the present 'production rate' of about 80 per 10,000. (Note: 'Production rate' means the ratio of cases of silicosis certified during the year to the average number of men at work.)

Pneumoconiosis Bureau

In 1916 the medical examination of miners was placed in the hands of the Miners' Phthisis Medical Bureau (now called the Pneumoconiosis Bureau), staffed by full-time medical officers. Periodical examinations were instituted including radiological examinations at each visit. Measures were introduced to prevent fraudulent practice such as substitution.

A most important regulation was introduced in 1917. This prohibited blasting the 'cut' and 'round' separately during one shift, and provided that blasting shall take place only once in 24 hours, at the end of the day shift, and that no person shall enter the mine until after a period subsequent to blasting which is fixed by the Inspector of Mines. Other provisions, important from the preventive angle, were the regulations concerning adequate ventilation, the appointment of a dust and ventilation officer on each mine, and the permitting of machine drilling only with axially water-fed drills. These regulations were amplified and amended from time to time in the light of further knowledge and experience.

Methods of dust determination were improved, the chief change being from the gravimetric to the particle-counting methods.

Lest the preceding brief review give the impression that preventive measures were forced by Government on more or less reluctant managements, it must be here recorded that the managements, both as regards the directorates and technical staffs, at least in the 42 years during which I have been associated with the Witwatersrand mining industry, have whole-heartedly and eagerly cooperated in the study and practical application of dust-control measures, and in this the Chemical, Metallurgical and Mining Society of South Africa has played a very worthy part.

Review of Results

At this point it might be as well to review the results of 40 years intensive endeavour in the campaign against silicosis in South Africa. Long statistical tables are a vexation to such a meeting as this. I shall therefore present this phase of my submission by means of 3 fairly simple graphs.

The first graph (Fig. 1) presents the mean ages of European miners who worked in the period 1918 to 1953. It can be seen that there is an upward trend.

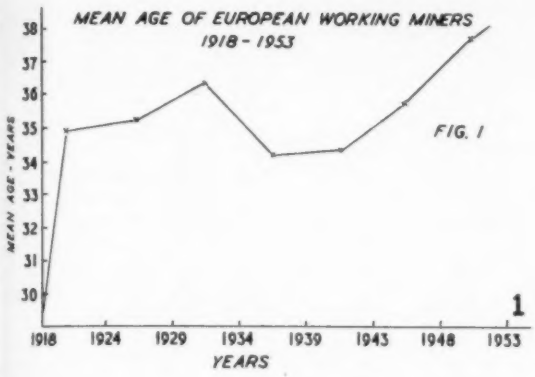
The second (Fig. 2) presents the mean ages of European miners at the time of their certification as having silicosis. Here too there is a marked upward trend, from 39·09 years to 53·12 years. The standard deviation is about 8·5 years.

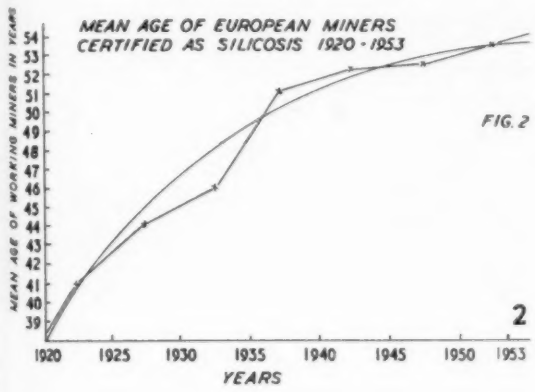
The third (Fig. 3) presents the 'production rate' of silicosis. There is a definite downward trend, except for the large peak due to the introduction of the ante-primary stage and another smaller peak which coincides with the introduction of 'pulmonary disability'.

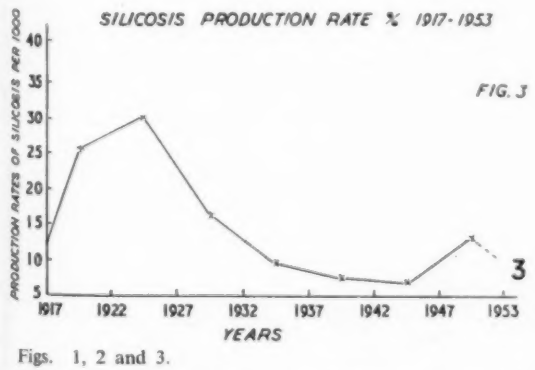
These graphs taken together can, I think, safely be stated as demonstrating that the prophylactic measures adopted—not the least among them the pre-employment examination of prospective workers—have very considerably reduced the hazard of silicosis.

RECENT RESEARCH

I shall close with a very brief review of a few points which may be of interest to you. The present knowledge of the aetiology and pathology of pneumoconiosis have been admirably presented to us by Drs. Walters, Webster and







Figs. 1, 2 and 3.

other speakers. I shall therefore confine myself to a few subjects not touched upon by them.

Size of Silica Particles

Animal experiments seem to show that the smaller particles are the most dangerous in the production of silicosis. This may be partly due to their more rapid solubility, and it is what we should of course expect if we accept that fibrosis is produced by the solution of silica particles lodged in the lung.

Another reason, however, for the greater danger associated with the smaller particles is that the time they remain suspended in the air is in inverse proportion to their size. H. S. Patterson (*Dust*, issued by the Transvaal Chamber of Mines, 1936) gives the free falling times for particles as follows:

Size in microns	*Time (in minutes) to fall* 1 *foot*
0·25	590
0·5	187
1	54
2	14·4
5	2·5

Assuming, therefore, a given number of silica particles in the inhalable air, the size frequency distribution becomes a matter of great importance in the pathogenicity of that dust.

It is also well to bear in mind that the greater the energy applied in fracturing a hard rock, the smaller will be the particle produced.

In a paper contributed to the Institution of Mining and Metallurgy on 15 June, 1939, H. S. Patterson discusses the size-distribution of particles produced in several kinds of rock by various processes of drilling. For the present purpose it is only necessary to summarize his findings thus:

1. The harder the rock the greater the number of small particles (less than 1 micron, 90%) with the same method of wet drilling.

2. Hard rocks produce more dust than soft rocks with the same method of wet drilling.

3. Dry drilling with a machine drill produces similar size frequency distribution in both soft and hard rocks, but the coarser particles predominate and coagulation of particles occurs.

4. In hand, hammer and jumper drilling the number of particles is small, the particles are larger, and they tend to coagulate.

5. When rock containing both hard and soft constituents is drilled, larger particles will tend to be produced from the softer constituent and smaller particles from the harder constituent.

Preventive Measures

From what was said, it follows that at present we must direct our attention to minimising dust, especially fine dust, in the air respired by the worker, and that we should be justified in regarding with some scepticism the ability of water to remove from the air the dangerous very fine particles.

Dust removal by means of suction applied at the drilling orifice does not seem at present to offer a satisfactory solution in practice, at least not in the conditions prevalent on the Witwatersrand gold mines.

At ore bins, filtration can be, and is, applied very effectively by various filters and also by electrical precipitation.

Blasting dust can be partly dealt with by sprays, but its danger must be neutralized further by ventilation and non-return of miners until the air is freed from dust as well as toxic fumes, as is laid down in Mining Regulation 158.

The work of Kettle, King and others has shown that in the test tube the solution of silica can be inhibited by several substances and that, of these *aluminium* is very effective.

The Canadian workers, Denny, Robson and Irwin announced that silicosis can be prevented by the inhalation of powdered metallic aluminium. For some years experiments were being conducted by Gardner and his associates at Saranac with hydroxides of aluminium. They also found that colloidal hydrate of aluminium could protect animals

against fibrosis caused by quartz. The excessive use of this substance, however, caused 'progressive infection with attenuated tubercle bacilli'. (Gardner—Donald E. Cumings Memorial Lecture, 11 May, 1944.)

Using metallic powdered aluminium, Gardner and his co-workers failed to confirm fully the results obtained by the Canadians. This may have been due to some fault in technique. They failed to obtain effective prophylaxis against quartz, although there was a delay in the production of lung fibrosis.

Experimental work on the effect of aluminium on the production of silicosis in animals has since been continued at Saranac with equivocal results. Experimental work of a similar nature has just been concluded at the South African Institute for Medical Research, and the results are now being studied; a report may be expected in due course.

Masks are now commercially available which filter out fine dust without unduly hampering respiration. These masks have, however, a very limited field of usefulness in mining, because industrial workers are unlikely to wear them effectively throughout a working shift.

Recently the use of fine *aerosols* has been proposed. This is used to some extent in the Congo copper mines. As is the case with aluminium, the data available are far from being convincing.

We are therefore left with the one sure prophylactic: Keep fine dust down to a minimum, and keep that minimum away from the respiration zone of the worker.

CHEST PAIN AS THE ONLY SYMPTOM OF GASTRIC ULCER

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The following four cases of gastric ulcer have presented recently with no symptoms of gastric disturbance except pain in the chest.

CASE 1. HIATUS HERNIA WITH GASTRIC ULCER AT SITE OF HERNIATION AND OESOPHAGEAL FIBROSIS

During attendance on a case of influenza, the patient, aged 64, casually remarked that after eating he felt some slight discomfort in the dorsal region of the chest, as well as in the upper right side of the front of the chest. The pain lasted for a few minutes and then disappeared. Swallowing hot food caused some discomfort in the sternal region. These symptoms appeared about 18 months before, but the patient did not take any notice of them; the pain at the beginning would last a few minutes, with intervals of complete silence, and gradually the pain was appearing more frequently and would last longer.

The history did not point to a gastro-intestinal condition. There was no heartburn, 'indigestion', epigastric pain, swallowing or belching of air, flatulence or fluid regurgitation. The patient's appetite was good, and his weight was maintained throughout.

Pain was the only symptom. It was of superficial neuralgia type, it was not constrictive, there was no sensation of choking, or fullness, or burning, nor was a boring element present. It did not have the quality of anginal pain, nor that caused by coronary thrombosis or aortitis (although cases of silent coronary thrombosis have been observed and might fit into this picture of rather inoffensive chest pain).

The examination of the patient did not reveal anything abnormal. His blood pressure was 140/90 mm. Hg, the pulse regular and normal. Radioscopy did not reveal any enlargement of the heart and the aortic contours were normal. The urine did not contain sugar or albumin.

The examination of the chest showed nothing abnormal and there was no evidence of any lung disease.

Differential Diagnosis

What condition might be indicated by this solitary symptom, casually mentioned by the patient?

Chest Conditions. Pleurisy, intercostal neuralgia, disease of the mediastinum and lung tumours were considered; they were eliminated by clinical examination. The pain in the dorsal region, although coming after eating, might have been due to some osteo-arthritic changes of the dorsal spine (see radiological report).

Cardio-Vascular. Aortitis, angina pectoris, coronary thrombosis and pericarditis were conditions to think about. Here again, all investigations proved negative.

Gastro-Intestinal. Cholecystitis, duodenal ulcer, abdominal aortitis, pancreatitis and hiatus hernia. These conditions could be eliminated with the exception of hiatus hernia.

Hiatus Hernia. On hearing the patient describe his slender symptoms I thought of a gastric ulcer associated with hiatus hernia; firstly because the pain was associated with the ingestion of food, and secondly because some pain was felt in the sternal region after swallowing hot food.

X-ray Examination. I accordingly requested Dr. Eric Samuel to X-ray the dorsal spine and to make a barium-meal examination for a possible ulcer. His report was as follows: 'There is marked thickening and irregularity of the mucosal pattern present throughout the lower end of the oesophagus. A well-marked hiatus hernia is present. The hernia itself is irreducible. At the junction of the stomach, at the site of herniation through the diaphragm, an ulcer crater is present. There is no evidence of an ulcer in the duodenal cap. There are extensive osteo-arthritic changes throughout the dorsal spine' (Fig. 1).

Diagnosis. The diagnosis, then, was hiatus hernia associated with a gastric ulcer and extensive fibrosis of the oesophagus.

Fig. 1. Barium meal X-ray showing marked shortening of the oesophagus and gross thickening of the mucosal folds. The thickened soft tissues of the oesophagus are clearly seen. An irreducible hiatus hernia is present and, at the site of herniation, in the stomach an ulcer crater is present.

Discussion

The causation of hiatus hernia is still widely discussed. Some attribute it to an inherent weakness of the diaphragmatic muscles, allowing the stomach to herniate into the thorax. Others—and with these I agree—regard hiatus hernia as secondary to gastric disease. It is pointed out that gastroduodenal ulcers are often associated with hiatus hernia. Gastric retention may cause reflux oesophagitis and subsequent hiatus hernia. The symptoms of hiatus hernia may resemble those of peptic ulcer. This is important in view of the surgical intervention which is often proposed. We have seen many such cases where after the surgical intervention the patients present themselves with the same symptoms. Unless one clears up the gastric symptoms first, direct surgical treatment of the hiatus hernia may not be rational.

Gastric Ulceration. There are 3 sites of gastric ulcer associated with hiatus hernia: (1) Duodenal or gastric ulcer localized in the usual sites of the fundus of the stomach or duodenal cap; (2) gastric ulcer situated in the herniated portion of the stomach; (3) a Barret's ulcer of the oesophagus. According to P. Marchand the incidence of herniated gastric ulcer in hiatus hernia is 10%.

Treatment. The question of treatment presents certain difficulties. Before surgical intervention is decided upon certain points must be elucidated. Surgical intervention is not justified unless the underlying cause of the hiatus hernia is treated. Then the condition of the oesophagus must be considered. It may be very irregular and fibrosed, making surgical intervention almost impossible. As already mentioned, we have seen cases where the surgical repair did not succeed in maintaining the hiatus hernia under control.

In the present case, surgical intervention is not indicated at this stage. Treatment should be continued on medical lines with a view to correcting the ulcerative lesion.

CASE 2. GASTRIC ULCER HIGH ON LESSER CURVATURE

A patient 48 years old, with no history of any digestive troubles, consulted me for acute pains in the upper part of the chest with slight irradiation to the left shoulder-region. There were no gastric signs such as heartburn, vomiting or hunger pain, and no tenderness in the epigastric region. The pain came intermittently and had no relation to food intake; food actually quitened the pain, which often came on at night. These symptoms had been present for 6 weeks. Clinical examination did not reveal anything abnormal in the cardio-vascular system; the blood pressure was normal the pulse full and regular, and on radioscopy the heart was not enlarged. A provisional diagnosis was made of a high-situated gastric ulcer and treatment instituted at once. A few days later, an X-ray examination was reported on as follows:

'The stomach is orthotonic. High on the lesser curve an irregular ulcer-crater is present. There is no

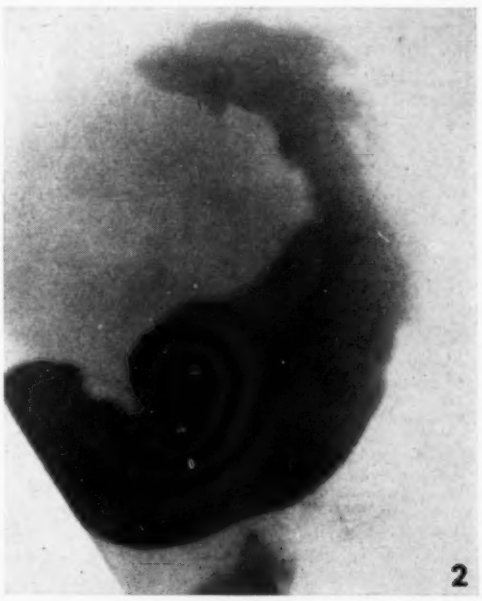

Fig. 2. Barium meal X-ray. The stomach is orthotonic. High on the lesser curve an irregular ulcer-crater is present. There is no evidence of mucosal destruction to be seen in the region of the ulcer crater, and there is no evidence of a filling defect.

evidence of mucosal destruction to be seen in the region of the ulcer crater and there is no evidence of a filling defect.'

The patient was given a diet rich in proteins, but was forbidden to take milk at all.* He was asked to keep an

Fig. 3. Barium meal X-ray. There is a slight irregularity of the lesser curvature of the stomach, but no sign of an ulcer crater to be seen.

emotional balance and was also given some anticholinergic tablets. After 6 weeks, another X-ray examination was made, with the following result:

'There is a slight irregularity of the lesser curvature of the stomach, but no sign of an ulcer crater to be seen.'

Case 3. GASTRIC ULCER HIGH ON LESSER CURVATURE

Mrs. Z.E., aged 40, complained of chest pain with slight propagation to the back. As the pain was high up in the chest, the patient thought that she had some lung trouble and applied embrocations and took aspirin, but the pain did not diminish at all, and 12 days later I was called in to see the patient. There was no evidence of any pulmonary disease, or of cardiac involvement. From the gastro-intestinal point of view there was a complete absence of any signs. In view of the frequency with which I had lately met with high chest pains linked with high-situated gastric ulcers, I submitted the case for X-ray, which confirmed the diagnosis of a gastric ulcer situated high in the lesser curvature. The X-ray report was as follows: 'On the lesser curvature of the stomach a shallow ulcer crater is present. The outline of the ulcer crater is smooth and well defined.'

* Gillman and Gilbert have shown experimentally that a disturbance of calcium-phosphorus metabolism may result in lesions of the kidney and arterial calcification with ulcers in the stomach or duodenum and coronary thrombosis. I have been able to confirm these findings clinically. I have found milk to be injurious in peptic ulcer and that patients did well on a high-protein diet with no milk.[3]

The patient was put on a high-protein diet with no milk and given anticholinergic therapy. The symptoms disappeared and an X-ray taken 3 months later showed no evidence of the pre-existing gastric ulcer. The X-ray report was as follows: 'The ulcer crater previously noted on the lesser curvature of the stomach has disappeared completely. The mucosal pattern of the stomach is less coarse than on the previous film.'

Case 4. TERTIARY SPASM OF THE OESOPHAGUS WITH SMALL SLIDING HIATUS HERNIA AND GASTRIC ULCER ON LESSER CURVATURE

Mrs. Z.M., aged 67, mother of the patient in case 3, consulted me for frequent abdominal pains. The only history was that for the last few years she had suffered frequent violent pains in the chest, and that a diagnosis of vagus irritation and the possibility of angina pectoris had been considered. The pain was high up in the chest with referred pain in the back. In recent months this chest pain had eased off, but abdominal pain had made an appearance.

On clinical examination nothing abnormal was found in the cardio-vascular system; blood pressure normal, no arrythmia, no dyspnoea. On cardioscopy the heart limits were normal. No evidence of pulmonary disease was found. There was absolutely no sign or symptom pointing to gastric disease; no pain in the epigastric region, no hunger pain, no vomiting, no loss of appetite, no flatulence, no eructation. The only clinical evidence of a possible gastric ulcer was the chest pain which appeared some years ago but subsided lately, and the abdominal pain. A barium enema carried out by Dr. Eric Samuel did not reveal anything abnormal, but in view of the chest pain a barium meal was done, which revealed tertiary spasm of the oesophagus and pseudo-diverticular formation (Fig. 4) with a small sliding hernia and a shallow ulcer on the lesser curvature of the stomach.

Fig. 4. There is a well-marked tertiary spasm of the oesophagus accompanied by pseudo-diverticular formation. A small sliding hiatus hernia is present at the lower end of the oesophagus.

SUMMARY AND CONCLUSION

Four cases of gastric ulcer (2 with hiatus hernia) are described, presenting with pain in the upper part of the chest, and little else suggesting a gastric condition. The pain in one case was very mild. In such cases the localization of the pain (high in the chest), and often its mildness, should suggest immediate investigation for gastric ulcer and hiatus hernia. Much time may otherwise be lost.

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BEHAVIOUR PROBLEMS IN CHILDREN

THEIR RELATION TO MENTAL HYGIENE AND PUBLIC HEALTH

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The prevalence of the psychoses and the percentage of hospital beds that are utilized for the treatment of psychotics has often been emphasized recently. These estimates are fairly accurate.

The psychotic, by the very nature of his illness, sooner or later comes under medical supervision. The problem of coping with the vast number of these patients is being handled by providing more beds and by the immense progress made in the psychiatrical treatment of the psychoses.

What of the neuroses? No survey of the general population has ever been undertaken to estimate the incidence of neurosis. Some indication is given by various authorities but the samples used are not representative of the general population.

Rowntree[1] reported that in United States Army registrants (1945) 15·2 per thousand were rejected because of psychoneurotic disorders.

In a representative group of 74 18-year-old youths studied on the eve of call-up for National Service, Logan and Goldberg[2] reported that 43 were stable and well adjusted, 19 were maladjusted in some respect, and 12 were clearly disturbed emotionally—so disturbed that psychiatric help would have been advisable.

Various other estimates have been advanced. Scrivener[3] estimates that 1/3rd of the consultations by general practitioners in England are for purely psychosomatic illnesses and 1/3rd for organic disease *plus* psychosomatic illness. In America, reliable observers believe that 50-75% of all patients seeking medical aid at present are suffering from some psychoneurotic ailment.[4] In South Africa, according to Alice Cox,[5] it has been conservatively estimated that neuroses represent some 30% of medical practice.

With the strains and stresses of modern life the incidence of neuroses is probably on the increase. Many people with major and minor neuroses suffer untold mental torture and unhappiness during their lives.

Apart from the social implications of the disease the economic factors must be considered. Pollock[6] estimated that in 1931 the economic loss due to mental disease in the United States was 742,000,000 dollars.

Russell Fraser[7] studied over 3,000 male and female workers in 13 light and medium engineering factories and showed that during the course of 6 months 10% (9·1% of the men and 13% of the women) had suffered from definite and disabling neurotic illnesses and a further 20% (19·2% of the men and 23% of the women) from minor neuroses. Neurotic illness caused between 1/4th and 1/3rd of all absence from work due to illness. Neurosis was responsible for the loss of 1·09% of the men's possible working days and 2·4% of the women's. This loss is equivalent to an annual absence of 3 working days for every man studied and 6 days for every woman. These losses were at least equal to those due to any of the 5 other subdivisions into which causes of absence were grouped, and amounted to between 1/5th and 1/4th of all absence from work from whatever cause. Russell Fraser also quotes other research workers' figures of neurosis in other occupations.

It is fairly obvious then that a large section of the community is suffering from this disease. As in any other disease, surely prevention is the best; and for neurosis it is the only cure.

Prevention of mental ill-health is mental hygiene. At this point a more explicit definition of the terms of mental health and hygiene is called for. The following definitions are arrived at by the World Health Organization Expert Committee on Mental Health.[8]

Definition of Mental Health

'The capacity of an individual to form harmonious relations with others and to participate in or contribute constructively to changes in his social and physical environment. It is also his capacity to achieve a harmonious and balanced satisfaction of his own potentially conflicting emotional drives—harmonious in that it reaches an integrated synthesis rather than the denial of satisfaction to certain instinctive tendencies as a means of thwarting others.' How many people have this capacity—even in part?

Definition of Mental Hygiene

'This term is often used as a euphemism for early psychiatric treatment, presumably in order to avoid the stigma which is still often attached to established psychotic disorders.

'The term should be used in its strict and literal sense, analogous to the way in which the general term "hygiene" is used in public-health practice.

'Therefore mental hygiene consists of the activities and techniques which promote and maintain mental health. Its practice demands that groups and individuals should examine and re-evaluate patterns of interpersonal relationships in the light of their influence on personality development and mental health. To accomplish this, education in theory alone is insufficient. It must be accompanied by practical methods of learning through actual person and group experiences, which foster emotional insight and modify behaviour in the direction of healthier personal relationships and healthier personality development.'

MENTAL HYGIENE AND PUBLIC HEALTH

Mental ill-health in an individual has always been dealt with by a psychiatrist, by the medical staff of a hospital, or by a general practitioner.

Public health on the other hand came into being because any group of people eventually has health problems thrust upon it. Thus public health became concerned with epidemics rather than with individual illness. The main problems resolved into those of housing, feeding, contagious disease, and industrial hazards to health. Great advances have been made in solving these problems and the span of life

has been greatly prolonged by the application of the knowledge acquired. The eventual solution is chiefly along economic lines.

Now that the physical ailments of the individual have been attended to, his mental needs come under review.

A physician treats a disease but cannot control the factors that bring about that disease, nor can he control an epidemic. A psychiatrist treats mental disease but cannot control all the factors that bring about mental disease.

The physician has to rely on the public-health authorities, why not the psychiatrist?

Another reason why public-health authorities should undertake mental hygiene is that they have the necessary organization available. In some cases it is only a skeleton organization, but even these can be used as a basis for mental hygiene.

The WHO Expert Committee on Mental Health[9] considers 'that the most important single long-term principle for the future work of WHO in the fostering of mental health is encouragement of the incorporation into public health work of the responsibility for promoting the mental as well as the physical health of the community'.

There are various methods of promoting mental health in a community. These methods are intended to assist people of all ages, but for a mental-hygiene programme to have the maximum effect it should be applied to children.

BEHAVIOUR PROBLEMS IN CHILDREN

It is the view of many authorities that behaviour defects in children are the forerunners of neuroses.

Oeser[10] says, 'Psychiatrists, especially those of a psycho-analytic background, have demonstrated that the roots of all neuroses lie in infancy and childhood, and in faulty ways of establishing equilibrium between needs and roles'.

Cottrell[11] states, 'Mental hygiene is vitally concerned with prevention—prevention used in the broad sense—in establishing conditions to further normal emotional life and the treatment of minor behaviour disorders, so that serious illnesses may be avoided'.

In describing a counselling service for parents of young children Lichtenberg and Wolfe[12] say: 'The service uses preventive techniques in the field of mental health to resolve minor difficulties and thus avoid the development of major problems. Psychiatric work with the parents of very young children who present minor behaviour difficulties can be most effective. In the majority of cases such difficulties arise out of some strain or tension in the relationships within the family group and not from any innate weakness.'

Maxcy[13] maintains that the most fundamental factor in the early conditioning of the personality is the parent-child relationship, and that the life-periods marked by most rapid development—infancy, childhood and adolescence—exert the greatest influence in determining the individual personality pattern.

Weisner[14] also stresses the importance of the early years, 'Behaviour problems do not appear abruptly; they have deep-seated origins of long standing. The specific episode, which usually leads to referral to a psychiatrist, is a relatively insignificant detail of the total picture. Many personality problems of children can be traced back to the impact of environmental conditions and parental attitudes during the first 2 years of life'.

Many more references can be given on this point, but having quoted to such a degree in order to correlate public health, mental hygiene and behaviour problems in children, I pass on to a brief mention of a recent survey (1953) of the incidence of behaviour problems amongst European children in Johannesburg.

Johannesburg Survey of Behaviour Problems in European Children

The sample consisted of 60 families belonging to the upper, middle and lower classes of the community. The percentage of children with previous or present abnormal behaviour was 44·7. Even if this figure were an over-statement due to various errors which might arise, a vigorous mental-hygiene programme to alleviate the position would still be indicated.

Advice was sought by the parents in respect of 50% of the children with behaviour problems. In about 80% of these the person consulted was a general practitioner; in the remainder a paediatrician was consulted directly.

The mothers of the other 50% of children with behaviour problems were asked whom they would have consulted, if they had sought advice. Again the majority said they would have consulted a general practitioner.

This indicates that a thorough grounding in mental hygiene (and particularly in the understanding and treatment of behaviour problems) should be given to every medical student. This is not being done at present, although visits to the Child Guidance Clinic have recently been included in the curriculum at the Witwatersrand Medical School. Because of the inadequate training much incorrect and perhaps damaging advice has probably been given to mothers in the past.

From the fact that in families with one or more children displaying abnormal behaviour only 50% of the mothers sought advice, it is obvious that some scheme is indicated whereby these families are investigated instead of waiting for them to take action. Stogdill,[15] in discussing the role of the public-health nurse, says: 'How are you going to reach parents who need this information (parent education) most? They are the very ones who are not interested. We did not stop immunization campaigns because it was hard to get cooperation from certain groups.'

Out of this arises the task of discovering a trainable person who has sufficient routine and intimate contact with the family at the time when children are born. The general practitioner has not this contact; he is only called in when there is physical illness. Even if he has a certain amount of pre-natal and post-natal contact he certainly has not the time for parent education and the seeking out of problems.

THE PUBLIC HEALTH NURSE (HEALTH VISITOR*)

Contact with the Home

In Johannesburg, the municipal health visitors make routine post-natal home visits in the case of every European child born in Johannesburg, whether the mother has attended the municipal ante-natal clinic or not. Where a mother has attended the ante-natal clinic serving the district in which

* In America the name 'Public Health Nurse' is given to the nurses who in South Africa, as in England, are called 'Health Visitors'.

she lives, she is in contact with the same nurse ante- and post-natally.

In the survey, out of the 60 homes investigated, 53 mothers had been visited after the birth or adoption of each child. In the other 7 cases, 5 of the families had been living outside Johannesburg when the children were born. In one of the 2 remaining cases the mother stated that the nurse had not called, and in the other the mother said that the nurse may have called but she could not be sure.

This demonstrates the efficiency of this section of the Public Health Department of the City of Johannesburg. The average number of visits to each home was 2·8. Usually there was one visit after the birth of each child. Only if a child was ill was more than one visit made after any particular birth.

Contact at Ante-natal and Post-natal Clinics

Of the 60 mothers in the survey, 35 (58%) attended either ante- or post-natal clinics or both. Of the remaining 25 mothers, 2 did not attend because the children were adopted and one because her children were born outside the area. The proportion of mothers attending these clinics in Johannesburg is increasing, and future surveys may show higher attendances.

Despite the fact that mothers of the middle and upper classes tend to rely on general practitioners rather than on clinics, the attendance in this survey amongst the different classes in Johannesburg is as follows: upper 30%, middle 71%, lower 68%. According to the chief health visitor in Johannesburg there has been an increase of attendances by the upper classes in recent years.

Training of Public Health Nurses

Public-health nurses in South Africa receive little or no training in mental hygiene. When questioned, many of those in the Johannesburg municipal health department stated they frequently encountered behaviour problems in their work, but were reluctant to give advice because of their lack of knowledge. Adequately trained nurses would go further and try to uncover these problems.

The social workers in Johannesburg professed the same avoidance of abnormal behaviour also—in spite of psychological training—because of the lack of practical knowledge of the subject.

In their third report the WHO Expert Committee on Mental Health[16] reports that 'public-health nurses, by virtue of their work, develop close and intimate relationships with people in their own homes and especially with people undergoing emotional stress'. Again in an earlier report[17] this Committee emphasizes 'the great importance it attaches to the revision of the education of all public-health nurses to enable them to play as effective a role in influencing the pattern of living of the community in a way which is favourable to mental health as they already do in physical matters'. In towns with a developed public-health department no other person has such a constant and intimate contact with the home.

Levy[18] states: 'Public-health nurses can be trained in mental-hygiene work, especially in pure hygiene and, apart from ante-natal contacts, she should visit the home of a newly born child 2 or 3 times in the first month of life. Thereafter the number of visits should be once a month in the first year of life and once every 3 months in the next 3 years.'

A SUGGESTED SYSTEM OF MENTAL HYGIENE

With adequate training of the public-health nurse in mental hygiene, a system is proposed in which the whole personnel of the child welfare section of the municipal health department —from the doctors to the office workers—should be trained in mental hygiene according to their capabilities and opportunity.

The department would control child-guidance clinics serving the various districts in the municipality. These clinics should have on their staff psychiatrists and psychologists and an adequate number of psychiatric social workers. This staff would have periodic and frequent discussions, and would cooperate with the other medical officers and public-health nurses of the child welfare section and advise with the more difficult psychiatric and behaviour problems. Cooperation with general practitioners, schools and nursery schools is also necessary.

To complete the picture it would be desirable to have mental hygienists employed by the Government to establish liaison with the local authority. At present, although the Government has a department of Mental Hygiene within the Public Health Department, no preventive work is undertaken.

There is a diversity of control of the various workers and institutions in a city and some difficulty will arise in co-ordinating them under the control of the municipal public health authority.

In smaller towns modified schemes are necessary and it will be many years before this can be accomplished in this country. However, plans should be made as soon as possible to meet what is a very real need.

SUMMARY

The prevalence of psychoneuroses is indicated and the responsibility of public health authorities and the possibility of their shouldering the burden caused by mental ill-health are discussed. Assuming that parent education and the treatment of behaviour problems in children is the easiest and most logical method of promoting mental hygiene, some relevant figures gathered in a recent survey of the incidence of abnormal behaviour amongst the children of Johannesburg are presented and discussed in relation to the public-health nurse as the chief instrument in mental hygiene programmes.

A system is suggested whereby all parents could have the opportunity of obtaining expert guidance relating to problems of behaviour arising in their children.

The inadequate facilities at present available to the general population is also mentioned.

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CROUZON'S DISEASE: HEREDITARY CRANIO-FACIAL DYSOSTOSIS

A CASE REPORT

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Johannesburg

Crouzon[1] in 1912 first described a form of cranio-facial dysostosis to which he gave the name' *dysostose cranio-faciale hereditaire*' emphasizing the hereditary factor. Atkinson[2] reviewed the literature and found 86 cases between 1912 and 1937 in which he believed the characteristics of the disease were unmistakable. However, only 58 of these fulfilled one of Crouzon's original criteria, that of heredity.

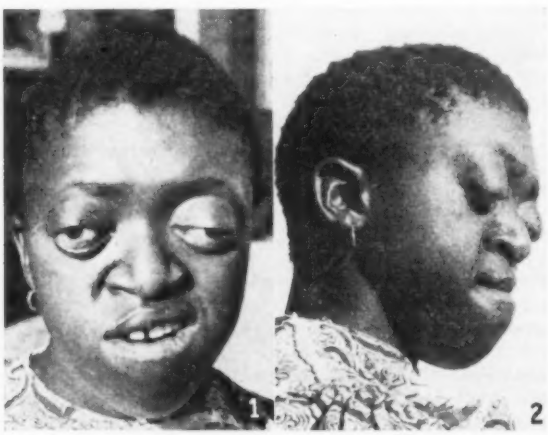

Fig. 1. Anterior view of patient showing tower skull, proptosis and divergence. There is no facial paralysis.
Fig. 2. Lateral view of patient showing proptosis, beaked nose, flattening over maxillary region, and marked prognathism.

The distinctive characteristics in the series reviewed by Atkinson are 4 in number, as follows:

Cranial deformities. These consist in a swelling of the frontal region, with an antero-posterior ridge overhanging the frontal prominence and often passing to the root of the nose. The transverse diameter of the head is large, causing it to be brachycephalic. There is early synostosis of the frontal sutures, and a basilar kyphosis.

Facial malformations. The upper jaw is aplasic, the mandible shows prognathism and the nose is like a parrot's beak. The facial angle is increased.

Eye changes. Exophthalmos is always present, and strabismus is mentioned in all but 5 cases. The fundi show evidence of optic neuritis and choked disc is not uncommon. Blindness in one or both eyes is by no means rare. Nystagmus is mentioned in 6 cases.

Heredity. This was especially emphasized by Crouzon, but in 28 cases of Atkinson's series there is no mention of its presence or of the existence of the disease in any other member of the family.

CASE REPORT

A Bantu girl aged 15 years presented herself at St. John's Ophthalmic Hospital, Johannesburg, on 29 January 1957. Her eyes had started to protrude at about 3 years of age, she had occasional pain behind the eyes, and her vision had deteriorated during the past 5 years. She could dislocate her eyes but this performance caused her pain. Her general health was good except for deafness in the right ear.

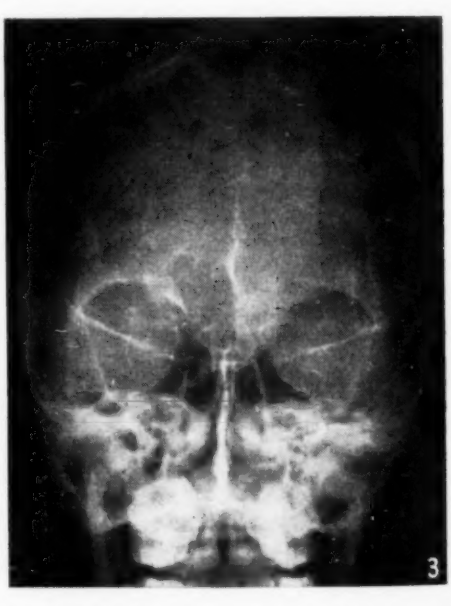

Fig. 3. Antero-posterior radiograph of skull. Sutures appear closed. Numerous convolutional markings.

She has 3 brothers and a sister who are normal. There are no other members of her family who have a similar deformity.

Examination

The patient was of normal stature for her age and apparently normal intelligence. There was marked bilateral proptosis with divergence of both eyes. The nose was beaked, with a flattening of the face over the maxillary region and a marked prognathism.

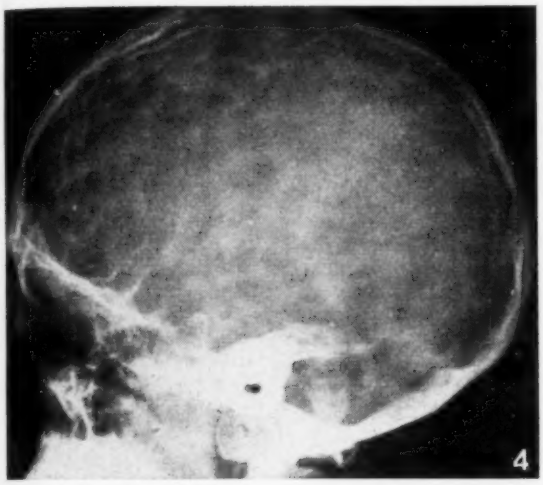

Fig. 4. Lateral radiograph of skull. Numerous convolutional markings. Floor of middle and anterior fossae shortened.

The palate was highly arched and the upper central incisors widely spaced.

The ocular movements were limited in all directions and convergence was absent. A pendular lateral nystagmus was present. The pupils were ectopic and the left gave a sluggish response to direct light. Fundal examination revealed that both optic discs were pale and the margins blurred, there was no evidence of papilloedema. The unaided visual acuity was 6/18 right, and 6/36 left.

Skeletal and general examination revealed no other abnormalities. Wassermann reaction negative.

In the X-ray of the skull the sutures appeared closed. Deep and numerous convolutional markings were present. The floor of the middle and anterior fossae was shortened. There was not much alteration to the sella turcica. These are the features of a cranio-stenosis of the oxycephalic variety.

COMMENT

No satisfactory explanation has been given to account for the malformation. Crouzon considered the condition to be hereditary and familial disease of a teratological kind and suggested that craniectomy might be a remedy for the deformity.

A cerebral decompression, with perhaps an orbital decompression by removal of the roof of the orbit, may be indicated if visual symptoms develop rapidly in the first years of life, but the deformity rapidly stabilizes and many patients have attained old age.[3]

In this case no treatment was indicated.

SUMMARY

A case is reported of Crouzon's disease in the Bantu, without evidence of heredity.

I should like to thank the Superintendant of St. John's Ophthalmic Hospital for his permission to publish this case, and also the X-ray Department of Baragwanath Hospital and the photographic section of the Witwatersrand University Medical Department.

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TRAUMATIC ANEURYSM

THE ANGIOGRAPHIC DEMONSTRATION FOLLOWING A FRACTURE OF THE FEMUR

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Cerebral angiography has been widely used in the diagnosis of cerebral trauma, especially chronic subdural haematomata. The use of percutaneous peripheral angiography in trauma of the limbs is a less well-established procedure. Modern advances in vascular surgery make it highly desirable to have as much information as possible before operation, especially the situation and nature of the lesion.

The following case demonstrates the value of angiography and indicates the necessity for a more widespread use of angiography in vascular injuries.

CASE REPORT

On 15 June 1956, the patient, J.C., who was aged 64 and a pensioner, was admitted to hospital after a fall which involved the stump of a below-knee amputation of his right leg.

While entering his flat in the dark, he had fallen on the amputation stump.

In 1947 he had undergone a below-knee amputation of his right leg after an accident and had been subsequently fitted with an artificial limb.

On admission the condition of the patient was fair. Pulse rate 92 per minute. Temperature 99°F. Blood pressure 158/74 mm. Hg. Nothing of note was observed on systematic examination. Massive bruising was present, extending from the right iliac fossa, round towards the right loin, and down over the right thigh. The femoral pulse was easily palpable, and the amputation stump was healthy. X-ray examination revealed a markedly comminuted fracture of the shaft of the right femur (see Figs. 1-3).

The swelling of the leg persisted and on 21 June immobilization of the fragments was attempted with a Steinmann's pin and Thomas's knee flexion splint. Subsequent X-ray examinations showed that the immobilization was ineffective.

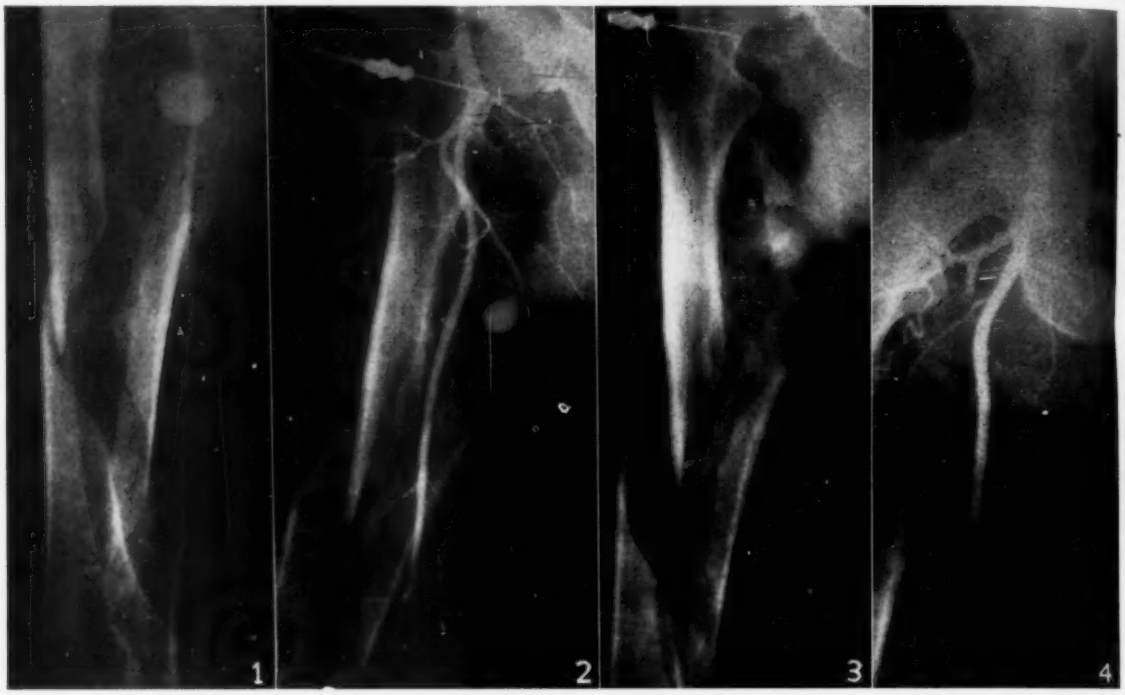

Fig. 1. Demonstrates a traumatic aneurysm apparently involving the femoral artery. The normal calibre of the femoral artery should arouse suspicion.

Fig. 2. The oblique film demonstrates that the traumatic aneurysm involves the profunda femoris artery only.

Fig. 3. Delayed film showing dye diffusing in the tissues.

Fig. 4. Follow-up plate showing the ligation of the profunda femoris artery.

Two weeks more elapsed with gradual increase in the size of the right thigh, and increasing signs of inflammation. Immobilization by means of skeletal traction was continued, but without much success. On account of the increasing swelling, needle aspiration was attempted and 100 c.c. of blood-stained fluid was withdrawn.

The right thigh continued to swell, and a week later, under general anaesthesia, a lateral incision was made into the right thigh and about 2 pints of dark blood was removed. Skeletal traction was re-applied. At this stage sepsis was increasingly evident.

One week later, the patient suddenly collapsed with all the signs of loss of blood, and emergency percutaneous femoral angiography was performed. The subsequent films showed a well-marked traumatic aneurysm of the profunda femoris artery (Figs. 1-3). The profunda artery was ligated proximally under general anaesthesia, as shown in a post-operative angiogram (Fig. 4), the Steinmann's pin was removed, and compression bandages were applied. Sepsis however became increasingly difficult to control, immobilization of the bone fragments was virtually impossible to achieve, and an amputation above the fracture was decided upon, and performed on 31 July.

Subsequently the patient developed septicaemia, and in spite of massive antibiotic therapy succumbed on 30 August 1956.

DISCUSSION

Watson-Jones[1] writes thus on traumatic aneurysms: 'The femoral artery is sometimes perforated in the upper thigh by one fragment of a fractured shaft of femur. The circumference of the thigh is increased several inches by a deeply fixed swelling, which is extremely hard, may slowly increase in size, does not at first pulsate, and may also present the clinical picture of a sarcoma of bone. After several months, as the haematoma undergoes resolution, the development of expansile pulsation and a sytolic bruit makes the diagnosis clear. Regular measurement of the limb should be recorded.'

The above description almost parallels the case in question, and it is in this type of case that angiography can be invaluable in arriving at an early diagnosis. Moreover, in any case of trauma where the extent of the swelling cannot be accounted for by the injury *per se*, resort should be had to angiography to exclude or confirm vascular injury. The presence of a good femoral pulse, as this case demonstrated, does not exclude vascular trauma.

TECHNIQUE

The subject of angiography is fully discussed in an article by D. Sutton.[2]

The technique of percutaneous peripheral angiography is easy, simple and relatively quick. The apparatus consists of (1) An ordinary serum needle, (2) polythene connection, and (3) a 20-c.c. syringe. This system is filled with saline.

Two other 20-c.c. syringes are necessary, one being filled with dye and one with saline. The purpose of the saline is to keep up continuous perfusion to prevent clotting once the artery has been successfully punctured.

The artery is now palpated digitally, the skin is punctured by the needle, and once the skin is punctured the syringe containing the saline is detached. The purpose of detaching the syringe is to enable the column of saline to be displaced by arterial blood, once successful puncture of the artery has been achieved.

The needle is now advanced until the pulsations of the artery are transmitted to the operator's fingers. Thereupon the artery is transfixed by the needle and upon slow withdrawal of the needle a column of bright red blood displaces the saline. Continuous slow perfusion is commenced until the radiographer is ready, when the injection of the dye is made as fast as possible, and further perfusion by saline is carried out until the films have been inspected and are satisfactory. Further aspects of this technique remain to be stressed.

1. The writer uses 60% urografin and overfills a 20-c.c. syringe. The first exposure is made when the syringe is three-quarters empty.

2. The value of a second film taken as soon as possible after the first film. In the case under discussion, in the second film (Fig. 4) visualization of the dye in the tissues is well demonstrated.

3. The importance of taking an oblique or lateral film wherever possible. In this case the first film suggested that the femoral artery was the site of the traumatic aneurysm, but the oblique film showed that the femoral artery was intact, and that the profunda artery was involved.

SUMMARY

A case of traumatic aneurysm following fracture of a femur has been described. The technique of percutaneous peripheral angiography is described. An attempt has been made to show the value of percutaneous angiography, and it is suggested that wider employemnt of angiography in trauma might be invaluable in certain cases, especially where vascular injuries are suspected.

I should like to express my indebtedness to Dr. Joss Kaye, Chief Radiologist of the Johannesburg General Hospital for his help and encouragement, and express my thanks to Miss Tompkins for her excellent reproductions.

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THE POLIOMYELITIS FOUNDATION RESEARCH, JOHANNESBURG

SURVEY OF WORK SINCE ITS INCEPTION FIVE YEARS AGO

As it is now 5 years since the inception of the work of the Poliomyelitis Research Foundation, the time is opportune to survey the extent to which the objectives of the Foundation have been achieved. These objectives are (1) To study poliomyelitis, (2) to study other virus diseases, (3) to study related problems, and (4) to produce a vaccine to immunize against poliomyelitis.

In the study of poliomyelitis one of the first objectives was to define the extent of the problem and to provide diagnostic facilities to differentiate the conditions which were commonly confused with poliomyelitis. To achieve this a number of units were established within the Research Division, as indicated below:

The Vaccine Division has been concerned since its inception with, firstly, the study of the methods of producing and of perfecting the techniques, and secondly, the large scale production of vaccine.

RESEARCH DIVISION

Poliovirus Unit

The poliovirus research unit has carried out systematic studies of a representative sample of cases of poliomyelitis occurring in the Union of South Africa, as well as those outbreaks occurring in the territories of Africa south of the Equator. In addition to providing laboratory diagnostic facilities necessary for the confirmation of a clinical diagnosis of poliomyelitis, this Unit has also systematically identified and typed all the polioviruses isolated in the course of its routine studies. The results of this typing study are shown in Table I. In the course of these studies it became clear that many cases admitted to isolation hospitals diagnosed as poliomyelitis were not in fact caused by polioviris.

TABLE I. POLIOVIRUS ISOLATIONS AND TYPING, JANUARY—APRIL 1957

	European			*Non-European*			*Total*
Types	1	2	3	1	2	3	
Cape Province ..	48	1	0	12	0	0	61
Natal	51	0	0	38	0	2	91
O.F.S.	8	0	0	2	0	0	10
Transvaal ..	180	1	13	37	3	1	235
Totals ..	287	2	13	89	3	3	397

Combined Totals

Types	1	2	3	
January-April 1957 ..	376	5	16	= 397
1956	655	25	50	= 730
1955	77	5	48	= 130
1954	61	18	9	= 88

Coxsackie Virus Unit

One of the most important contributions made by the Coxsackie virus unit was to establish that a proportion of these cases were caused by Coxsackie viruses, and this Unit was one of the first in the world to establish the importance of this group of viruses in causing a disease resembling that of non-paralytic poliomyelitis. In addition, the Coxsackie viruses were incriminated as a cause of an acute, often fatal, disease of newborn babies, known as myocarditis neonatorum, and have also been identified as the cause of several other conditions in older children and adults. All specimens submitted for the isolation of poliovirus have also been tested for the presence of Coxsackie virus and this systematic study has emphasised the importance of this group of viruses in causing disease in this region of the world.

Echo Virus Unit

In the course of attempts to isolate poliovirus from specimens sent for this purpose, a large number of other viruses, neither poliomyelitis nor Coxsackie, have been isolated. These belong to the group of Echo viruses, and it is apparent that these are also an important cause of an illness resembling poliomyelitis. The study of these viruses has been undertaken by the Echo virus team under Dr. H. H. Malherbe.

Arthropod-borne Virus Unit

It was considered that in elucidating the picture of poliomyelitis a special study should be made of the arthropod-borne viruses. Many of these, such as the viruses causing St. Louis and Japanese B encephalitis may cause an illness somewhat similar to that of poliomyelitis. After preliminary discussions with Dr. Hugh Smith, associate director of the Rockefeller Foundation, arrangements were made to establish a team to work in South Africa. The Rockefeller Foundation undertook to send two of its senior staff members; and Dr. K. C. Smithburn and Dr. R. H. Kokernot,

both experienced virus workers, came to South Africa to head the investigations. The South African Institute for Medical Research undertook to provide several senior staff officers and the technical staff for this work, and the Poliomyelitis Research Foundation has provided laboratory accommodation and laboratory services. Dr. Smithburn arrived in November 1953 and for the rest of that year was occupied in the organization of the team, and work really began in 1954.

The first object of the investigation was to define the extent of the problem of these arthropod-borne viruses. To achieve this several field expeditions were undertaken covering the greater part of the Union of South Africa. During these expeditions bloods were collected from a representative sample of the human population, of domestic and wild animals and birds, and arrangements were made to collect mosquitoes and other insects and arthropods, and blood was also collected from cases of feverish illness occurring in the neighbourhood. Immunity tests were carried out on these bloods and attempts were made to isolate viruses from insects and arthropods and from the blood of human patients. In the 3 years in which this study has been under way, notable contributions to our knowledge have been made. It has been shown that many of these arthropod-borne virus diseases are widespread in the Union of South Africa, while others are of more limited distribution. The area particularly favourable to the propagation of this group of viruses was found to be northern Natal and a field station was established in the Ndumu Game Reserve in 1955. Detailed studies have since been carried out in this area and a number of viruses hitherto unknown have been isolated and characterized, and a number of viruses previously known to occur in Central Africa have been proved to occur in this region of South Africa. The mosquito vectors of a number of these diseases have also been identified.

In addition several special expeditions have gone into the field to investigate important outbreaks of disease infecting man and animals. Included in these have been the study of outbreaks of Rift Valley Fever and Wesselsbron Fever in the Orange Free State and the Northern Cape. An expedition also went to the Eastern Transvaal to study an outbreak which was subsequently identified as being due to Chikungunya Fever. The contributions made by this team have been of fundamental importance and also of the greatest practical value in defining and in helping to solve medical and veterinary problems in this country.

Animal Viruses Transmissible to Man

The team consisting of one or two members only, concerned with the investigations of animal diseases transmissible to Man, have in this period proved for the first time the occurrence of Rift Valley Fever in South Africa, and also identified the mosquito vectors of the disease and devised some diagnostic tests. This team has also identified several cases of psittacosis and incriminated budgerigars as a source of the infection. They are also concerned with the diagnosis of rabies, which assumed a new importance when in 1950 the dog type of rabies was introduced into this country for the first time in 50 years from across the Limpopo and spread extensively through the Northern and Eastern Transvaal and Swaziland. This Unit has provided the service for the diagnosis of this disease and has devised tests of value for this purpose. Studies have been carried out on strains of rabies virus suitable for preparing vaccine, and the protective value of serum prepared in the serum laboratories of the S.A.I.M.R. has been the concern of this Unit.

As a result of the studies carried out on cases suspected of being poliomyelitis, other causes of inflammation of the central nervous system have been identified. Amongst these are leptospiral infections, of which several cases have been proved by laboratory test recently. The source of these infections have been traced to the patients' dogs.

Serology Unit

The Serological Unit has provided facilities for carrying out immunity surveys of representative samples of the populations of the Union of South Africa as well as several of the territories of Southern Africa and of the neighbouring islands. These immunity surveys are of importance in determining the incidence of the three types of poliovirus in these various territories and islands.

The immunity test has also been in great demand to determine whether children are still susceptible to infection with one or other of the types of poliovirus and therefore their need for vaccination. Many thousands of tests have been carried out during the past two years and this Unit is obviously fulfilling an urgent need. This Unit is also responsible for carrying out the tests for determining the potency of poliomyelitis vaccine.

These studies and the provision of diagnostic services for the study of virus diseases have already clarified the picture of poliomyelitis occurring in Southern Africa to a considerable extent.

Respiratory Virus Diseases Unit

By arrangement the Poliomyelitis Research Foundation has provided laboratory accommodation for the Influenza centre of the South African Institute for Medical Research. This Unit is the World Health Organization's influenza centre for Southern Africa and is responsible for keeping check on the occurrence and incidence of influenza in this region. This necessitates the isolation and identification of flu-virus from a representative sample of cases in each epidemic as it occurs. During the past 5 years the viruses causing influenza in South Africa have been studied and compared with other viruses in other regions of the world in collaboration with the WHO Influenza Centre in London and several important observations have been made.

Biochemistry and Biophysics Unit

In the Biochemical and Biophysical department, Mr. Hampton has worked in collaboration with Dr. Polson, of Prof. van den Ende's unit in Cape Town and has devised methods of purifying and concentrating poliovirus which may be of the greatest practical importance in preparing vaccine.

Cancer Research Virus Unit

An application was made for a grant to assist the study of some aspects of cancer. In this study a spectrum of viruses is being tested against a spectrum of cells in tissue culture. A grant supporting it has been made and the investigation is getting under way. It, too, should yield information of considerable value.

Various

Several special investigations have also been undertaken by the Research Division into outbreaks of disease. Notable amongst these was the study of the outbreak of Durban 'mystery disease' in 1955.

VACCINE DIVISION

Production Unit

One of the main purposes of the Foundation has been to produce a vaccine against poliomyelitis. When the buildings were designed there was no immediate prospect of being able to do this. However, one half of the institution was designed for this purpose and is now fully occupied in the large-scale manufacture of poliomyelitis vaccine. The team under Dr. Winter concerned with the production of poliomyelitis vaccine have carried out a number of studies to determine the value of our South African monkeys for the production of the large amounts of virus necessary for the production of vaccine, and have also systematically tested the different tissues of the monkey to determine which of these are the best. In the course of these investigations we were in regular communication with the workers engaged on similar projects in the United States, Canada, Britain, Sweden, and Denmark, and after the completion of these preliminary studies the large scale production of vaccine was begun in 1954. The first batch of vaccine was issued in 1955 and South Africa was one of the four countries in the world able to do this. It may be noted that but for the generous contributions of the public to the funds of the Poliomyelitis Research Foundation, this would not have been possible.

However, a number of difficulties have been encountered, not alone in this country, which have delayed the issue of a large amount of vaccine, and it was not possible to maintain the rate of production necessary to meet the full demands of the country. It therefore became necessary to import a fairly large amount from the United States. It is hoped that it will be possible to meet future demands, and it is anticipated that about 1,500,000 doses will be released for issue during the ensuing year.

Safety Testing Unit

In the course of safety testing the vaccine a number of viruses have been isolated from the tissues used, and a detailed study of these viruses by Dr. Malherbe and his team has contributed to our understanding of this somewhat unexpected problem.

GENERAL

During the 5 years under review 25 papers have been published. The Poliomyelitis Research Foundation, in providing facilities for the study and diagnosis of virus diseases has met an urgent need, and these facilities are being called upon by private medical practitioners, local health authorities, provincial hospital authorities, and the central Government, to an increasing extent. This is shown particularly in the ensuing report, which considers in more detail the work of the past year.

June 1957

OFFICIAL ANNOUNCEMENT : AMPTELIKE AANKONDIGING

TARIFF OF FEES FOR APPROVED MEDICAL AID SOCIETIES

The correction of many anomalies in the Tariff of Fees for Approved Medical Aid Societies and the negotiations which have been necessary to obtain their correction have inevitably resulted in delay in producing the new booklet. It is hoped that this will be distributed to all medical aid societies and members of the Association during the latter half of August. The date from which the Tariff will become operative will be 1 August and practitioners should await the arrival of the new Tariff Book before submitting accounts for work undertaken during the month of August. If members do submit accounts for work done during August according to the old Tariff, these accounts will not be subject to revision when the new Tariff Book is published.

A. H. Tonkin
Secretary

Medical House
Cape Town
1 August 1957

TARIEF VIR GOEDGEKEURDE MEDIESE HULPVERENIGINGS

Die publikasie van die nuwe tariefboek is onvermydelik vertraag deur die regstelling van die vele ongerymdhede in die tarief van gelde vir goedgekeurde mediese hulpverenigings en deur die onderhandelinge wat nodig was om hierdie saak in orde te bring. Ons hoop dat hierdie tariefboek teen eind-Augustus uitgereik sal word aan alle mediese hulpverenigings en aan lede van die Vereniging. Die tarief is geldig met ingang 1 Augustus en praktisyns moet wag op die nuwe tariefboek voordat hulle rekenings uitstuur vir behandelings gedurende Augustusmaand. Indien lede wel rekenings volgens die ou tariewe wil voorlê vir werk wat hulle in Augustus verrig het, sal hierdie rekenings nie verander kan word wanneer die nuwe tariefboek verskyn nie.

A. H. Tonkin
Sekretaris

Mediese Gebou
Kaapstad
1 Augustus 1957

DISPENSING OF PRESCRIPTIONS FOR POTENTIALLY HARMFUL DRUGS

In communicating under date 26 July 1957 to the Secretary of the Medical Association of South Africa the following extract from the report of the South African Pharmacy Board for the 6 months ended 31 January 1957, the Secretary of the Pharmacy Board observes that 'as these rulings are now binding on all pharmacists, it would eliminate possible misunderstanding if the position could also be explained to all doctors:

'The following rulings were given on the dispensing of prescriptions for potentially harmful drugs:

1. A prescription for a Potentially Harmful Drug with the instructions 'repeat as required' may not be dispensed because it does not indicate the number of repeats.

2. A prescription for a Potentially Harmful Drug with the instructions 'repeat monthly indefinitely' may not be dispensed because it does not state the number of repeats.

3. A prescription for a Potentially Harmful Drug with the instructions 'to be taken as directed' may be dispensed if otherwise in order.

4. A prescription for a Potentially Harmful Drug with the instructions '½ to 2 tablets to be taken four-hourly when required' with further instructions to 'repeat monthly for 2 to 3 years' may be dispensed as instructed.

5. A prescription for a Potentially Harmful Drug with the instructions 'repeat monthly for 2 years' may be dispensed and repeated 24 times at monthly intervals.

6. In the opinion of the Board there is no responsibility on the chemist and druggist to take any action to compel a medical practitioner to provide a prescription which he has telephoned to the chemist and druggist.

VERENIGINGSNUUS : ASSOCIATION NEWS

TAK WES-KAAPLAND, AFDELING NOORDWESTE

Die Stigtingsvergadering van hierdie Afdeling het op 13 Julie te Vredendal plaasgevind. Ten spyte van slegte weer was die opkoms heeltemal bevredigend en almal het die dag geniet.

In die namiddag is 'n kliniese vergadering gehou waarby drs. F. M. Charnock, R. F. Maggs, J. N. de Klerk en A. Swanepoel opdragte gelewer het.

Daarna is die Komitee verkies en die volgende lede is aangestel: *Voorsitter* Dr. D. J. Slabber, Calvinia; *Ondervoorsitter* Dr. T. Nortje, Vredendal; *Sekretaris* Dr. J. Dommisse, Williston; *Lede*—Dr. T. Roux, Vredendal, en Dr. F. J. van Niekerk, Citrusdal.

'n Funksie vir die vrouens was ook in die namiddag gereël en die aand het ons weer bymekaar gekom vir 'n baie aangename dinee, waarvoor ons ons Vredendalse kollegas hartlik dank.

Die volgende vergadering sal Vrydagaand, 30 Augustus te Calvinia plaasvind en sal toegespreek word deur die volgende lede van die Tak: Prof. J. T. Louw, Prof. Len Eales, Dr. W. G. Schulze en Dr. P. J. M. Retief.

PASSING EVENTS : IN DIE VERBYGAAN

Dr. Neville Sacks, B.Sc., M.B., Ch.B. (Aberd.), M.R.C.P.E., wishes to advise his colleagues that he has joined Dr. I. Sacks in practice as a Specialist Physician at 58-59 S.A. Mutual Building, Bloemfontein. Telephone: rooms 3903, residence 3413.

Dr. Neville Sacks, B.Sc., M.B., Ch.B. (Aberd.), M.R.C.P.E., wil graag sy kollegas in kennis stel dat hy by dr. I. Sacks aangesluit het in die praktyk as Spesialis-Internis by S.A. Mutualgebou 58-59, Bloemfontein. Telefoon: kamers 3903, woning 3413.

Dr. Sidney J. Hersch, M.B., B.Ch., F.R.S.C. (Eng.), Specialist Surgeon, has changed his address from 10th floor, Ingram's Corner, Hillbrow, Johannesburg, to Clarendon Centre, East Avenue, Clarendon Circle, Johannesburg. The telephones remain unchanged, viz. rooms 44-9587, residence 43-7168.

* * *

Dr. Jack Penn, M.B.E., M.B., B.Ch., F.R.C.S. (Edin.), Plastic Surgeon, has changed his address from 10th floor, Ingram's Buildings, Hillbrow, Johannesburg, to Clarendon Centre, East Avenue, Clarendon Circle, Johannesburg. The telephones remain unchanged, viz. rooms 44-9587, residence 43-1910.

* * *

The South African Paediatric Association Prize. This Association's 1956 Prize, open to 5th- and 6th-year medical students for the best essay entitled 'The Problem of Rheumatic Fever in Children with special Reference to its local Incidence, Aetiology and Management', was divided equally between Mr. L. Jansen of Pretoria University and Mr. L. S. Taitz of Witwatersrand University.

* * *

Members are reminded that they should notify any change of address to the Secretary of the Medical Association of South Africa at P.O. Box 643, Cape Town, as well as to the Registrar of the South African Medical and Dental Council, P.O. Box 205, Pretoria.

Failure to advise the Association can only result in non-delivery of the *Journal*. This applies to members proceeding overseas as well as to those who change their addresses within the Union.

* * *

Unie van Suid-Afrika. Departement van Gesondheid. Aangifte van ernstige epidemiese siektes en poliomiëlitis in the Unie gedurende die tydperk 19 Julie—25 Julie 1957.

Poliomiëlitis

	Bl.	*Nat.*	*Kl.*	*As.*	*Totaal*
Transvaal	—	3	—	—	3
Kaapprovinsie ..	1	1	2	—	4
Oranje-Vrystaat ..	—	—	—	—	—
Natal	2	3	—	—	5
Totaal ..	3	7	2	—	12

Tifuskoors

Twee (2) Blanke gevalle en een (1) Naturellegeval in die Somerset-Oos-Afdelingsraadgebied. Diagnose deur laboratoriumtoetse bevestig.

Pes, Pokkies. Geen.

Korreksie:

Een (1) Naturellegeval (Kranzkop-distrik) aangemeld in Nuusbrief No. 19 is onlangs gediagnoseer as nie Poliomiëlitis.

IN MEMORIAM

DR. JACOBUS SIEBERT, M.B., CH.B., M.R.C.P.E.

Dr. Willem P. Steenkamp writes: With the passing of Jim Siebert, the medical world as well as humanity, has suffered a great loss.

Dr. J. Siebert

Jim was essentially a self-made man. He started life in the Post Office, but soon realized that the Civil Service would not fulfil his ambitions. He therefore began saving money and studying in his spare time. Eventually he realized his ideal and qualified at the Cape Town University as a medical man. The hard school in which he served as a youth left a mark on his character and stamped him as a conscientious worker, a fact which in no small way was responsible for the big practice which he quickly built up in Cape Town.

After the outbreak of hostilities he joined the army and soon attained the rank of major. When peace returned he proceeded to Edinburgh for postgraduate study and, after his return to Cape Town, set up in practice as specialist physician, later being appointed as consulting physician to the Railway Sick Fund. He soon built up a big consulting practice, being a hard worker and having a charming personality. The writer can personally vouch for his diagnostic acumen, which was almost uncanny thanks largely to the good foundation laid by years of general practice—still the best basic training for any speciality.

He attained very high rank in the masonic world, which was his favourite hobby and charity.

His hard youth and strenuous career unfortunately took their toll and prematurely clouded a brilliant life. It was, however, a cloak folded round one of His tired children by the Great Architect of the Universe, and after Jim had to give up his practice he did not realize the seriousness of it, not even when a palliative operation had been performed. As distinguished and well dressed as ever, he used to come to town and visit colleagues and friends, till a few days before the end, when he became too weak to leave his bed.

Jim left as had been the case all his life—no complaints. His duty nobly done, he was beloved by friend and foe alike, because he was essentially a man. To know that Jim will welcome them on the other side will make the crossing easier for the friends he left behind.

BOOKS RECEIVED RECENTLY IN THE WITWATERSRAND MEDICAL LIBRARY

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REVIEWS OF BOOKS : BOEKRESENSIES

INDUSTRIAL MEDICINE

The Life, Works and Times of Charles Turner Thackrah. A. Meikeljohn. 25s. nett. Pp. vii+238 with 7 illustrations. Edinburgh: E. & S. Livingstone, Limited. 1957.

Contents: Preface. 45 pages of life and times of Thackrah. The effects of Arts, Trades and Professions on Health and Longevity.

Here is a book on a pioneer of industrial medicine. The life, work and times of Charles Turner Thackrah are sketched in an essay consisting of 45 pages; the balance of 233 pages being a facsimile reprint of his *magnum opus*, 'The Effects of Arts, Trades and Professions on Health and Longevity.'

Originally published in London in 1832 and long out of print, this book gives a life-like picture of the life and working conditions of the England of the early 19th century when the industrial revolution had got into its stride and the baleful effects of industrial hazards had not yet been recognized.

Thackrah was one of the earliest to realize the dangers the workman incurred as a result of his occupation. In those days, when working hours were 'reduced from 72 to 69 hours per week', it is interesting to note that 'footmen who stand long behind

carriages are said to be frequently affected with hydrocele', that the 'comparative rarity moreover of aged men in distilleries . . . leads to the opinion that life is abbreviated either by the inhalation or potation of spirit', and that 'Bronzers in general are said to be intemperate.'

The book is very well got up. Several portraits of Thackrah and illustrations of the contemporary scene enliven its pages. The enquiring reader will find any more illustrations he may need in any volume of Hogarth's engravings. A splendid production.

T.S.

X-RAY DIAGNOSIS

Röntgendiagnostik. Ergebnisse 1952-1956. Herausgegeben von H. R. Schinz, R. Glauner, E. Uehlinger. Unter Mitarbeit von W. E. Baensch, J. E. W. Brocher, U. Cocchi, R. Glocker, W. Hess, R. Janker, O. Norman, R. Prévôt, G. Schoch, E. Uelinger, S. Welin, J. Wellauer, G. Yasargil, E. Zdansky. Seiten xii + 590. 550 Abbildungen in 892 Einseldarstellungen. DM 139. Stuttgart: Georg Thieme Verlag. 1957.

Inhaltsverzeichnis: Vorwort. Der Strahlenschutz in der Röntgendiagnostik, *R. Glocker*. Neuere Ergebnisse der Wirbelsäulendiagnostik, *J. E. W. Brocher*. Benigne und semimaligne cystische Knochengeschwülste, *E. Uehlinger*. Was leistet die Röntgenuntersuchung für die Beurteilung der Herzfunktion des Erwachsenen? *E. Zdansky*. Die Angiokardiographie der kongenitalen Anomalien des Herzens und der grossen Gefässe mit Rechts-Links-Shunt, *R. Janker*. Die abdominale Aortographie, *J. Wellauer*. Arteriographie der Extremitäten, *J. Wellauer*. Venographie, *J. Wellauer*. Vertebralisangiographie, *G. Yasargil*. Zur Diagnose und Differentialdiagnose der Lungengerüsterkrankungen: Entzündungen und Dystrophien, *E. Uehlinger und G. Schoch*. Vanishing lung, progressive Lungendystrophie, *E. Uehlinger*. Das Mittellappensyndrom, *E. Uehlinger und G. Schoch*. Der kleine Magenkrebs, *R. Prévôt*. Gutartige Pylorushypertrophie des Erwachsenen, *R. Prévôt*. Der Magenschleimhautprolaps, *R. Prévôt*. Karzinome, Karzinoide, Sarkome und gutartige Tumoren des Dünndarms, *W. E. Baensch*. Die nichtsklerosierende Ileitis, *R. Prévôt*. Röntgendiagnostik von Kolonpolypen. *S. Welin*. Pneumoretroperitoneum und Pneumomediastinum, *U. Cocchi*. Die Cholangiographie mit Biligrafin, *R. Prévôt*. Cholangiographie intra operationem. *W. Hess*. Hystero-Salpingo-Pelvigraphie, *O. Norman*. Autorenverzeichnis. Sachverzeichnis.

This is a review of the developments which have taken place in diagnostic radiology since the end of the second world war. The advances in radiotherapy have not been included. In this relatively small book the authors have succeeded in giving a clear and concise account of almost the whole field, combining both precise details of technique for those of practice and a complete general picture of the latest advances for those engaged in research work.

The book opens aptly with a chapter on protection from X-rays during diagnostic procedures—a much discussed problem today. It warns that one must never lose sight of the need for protecting both patient and radiologist.

Although written by continental authors, developments which have taken place in other parts of the world are included and fully discussed in the text.

Throughout, the diagnostic procedures are viewed in their proper clinical perspective, and thus the book will appeal not only to the roentgenologist, but also to physician and surgeon alike.

It would be pointless trying to review separately each one of the excellent articles, many of which are monographs in their own right.

The book is 'a must' for those who can read German, and it can be confidently recommended to those not fluent in that medium, for it is lavishly illustrated with many more pictures than pages of excellent and pertinent radiographs, diagrams and pathological specimens, which tell the story without one's having to consult the text.

Each chapter is provided with an extensive bibliography.

R.H.G.

FRACTURES AND JOINT INJURIES

Outline of Fractures Including Joint Injuries. By John Crawford Adams, M.D. (London), F.R.C.S. (England). Pp. vii + 248. 218 Figures. 27s. 6d. net + Postage Abroad 11d. Edinburgh and London: E. & S. Livingstone Ltd. 1957.

Contents: Introduction. I. General Features of Fractures. II. Principles of Fracture Treatment. III. Joint Injuries. IV. Injuries of the Spine and Thorax. V. Injuries of the Upper Extremity. VI. Injuries of the Lower Extremity. Index.

This is an excellent little book. As outlined in the author's preface, it has been written primarily for the medical student, the busy practitioner and the physiotherapist. The author outlines the requirements such a book should fulfil and the reviewer agrees with his criteria, and feels that he has achieved his intentions exceedingly well.

A book of this nature should be concise, and, if necessary, dogmatic. Here again the author has managed to adhere to these essentials with praiseworthy success. The keynote in treatment has been conservatism, which the reviewer feels is in keeping with the demands of the readers for whom the book is intended.

It is difficult to single out individual sections of the book, but it can be confidently stated that the section dealing with features of the neck of the femur is very well covered. The reviewer is surprised, however, that in the section on fractures of the shaft of the femur no mention is made of fixed traction as opposed to sliding traction.

The illustrations are well reproduced and convey the salient information at a glance.

This is a book which will fill great want, on the shelves of the medical student in particular.

G.D.

PAEDIATRIC NURSING

A Textbook on the Nursing and Diseases of Sick Children for Nurses. Sixth Edition By Various Authors. Edited by Alan Moncrieff, C.B.E., M.D., F.R.C.P., J.P. and A. P. Norman, M.D., F.R.C.P. Pp. xvi + 777. Illustrations 146. 50s. net. London: H. K. Lewis & Co. Ltd. 1957.

Contents: Preface to Sixth Edition. Extracts from Preface to First Edition. *Part I. General Considerations and Nursing.* Introduction. I. The Normal Child—Management and Care. II. Preventive Medicine and Child Health. III. The Sick Child—Management and Care. IV. The Nursing of Sick Children at Home. V. The Collection and Observation of Specimens. VI. General Nursing Procedures in Childhood. VII. Bacteriology. VIII. The Process of Inflammation. IX. General Principles of Surgical Technique. X. Anaesthesia and Anaesthetics. XI. Pre-Operative and Post-Operative Nursing Care. XII. Haemorrhage and Shock. *Part II. Diseases of Children.* XIII. Diseases of the Newly-Born. XIV. Dietetics in Childhood. XV. Breast Feeding. XVI. Artificial Feeding. XVII. Disorders of Nutrition and Metabolism. XVIII. Diseases of the Endocrine System. XIX. Diseases of the Circulatory System. XX. Tuberculosis, Rheumatism and Nephritis. XXI. Diseases of the Skin. XXII. Diseases of the Nose, Throat and Ears. XXIII. Diseases of the Respiratory System. XXIV. Disorders of the Alimentary System. XXV. Surgical Disorders of the Alimentary System. XXVI. Functional Nervous Disorders. XXVII. Neurosurgery. XXIX. Orthopaedic Surgery, Part I. XXX. Orthopaedic Surgery, Part II. XXXI. Orthopaedic Surgery, Part III. XXXII. Surgical Diseases of the Genito-Urinary System. XXXIII. Diseases of the Eye. XXXIV. Burns. XXXV. Plastic Surgery. XXXVI. Tumours and Cysts. XXXVII. Infectious Disorders. XXXVIII. Children in the Tropics. Appendix. Index.

This book, having reached its 6th edition, is obviously one for which there has been considerable demand. The latest version will probably be just as popular. It is over 700 pages long, and the twin editorial pens might have been driven more ruthlessly through a great deal of the contents to make them suitable for nurses, not sister-tutors or medical students. Any paediatric nurse who invests in this gospel of Great Ormond Street will certainly have her money's worth if she has the time and staying power to assimilate it.

Some sections, such as those concerned with general nursing management, bacteriology, burns, plastic surgery, functional nervous diseases and X-rays, are admirable. But throughout the whole text are scattered items which are certainly peculiar if not intended as comic relief. The preparation of solutions from pure drugs (page 94) is pure pantomime. Some of the tit-bits of mediaeval information on poultices, leeches, mustard baths, blisters, cupping, and recipes for sherry whey and the inevitable, inexplicable, an innutritious bone and vegetable broth are surely no part of the training of a modern nurse. Comparable comment is called for in other respects in that the instruction is not in keeping with current practice and thought. Are there still people who clothe premature babies in union flannel and feed them every hour, who think that mastitis is very common in newborn infants, that strapping of umbilical hernias is really beneficial, that rectal prolapse is wilfully produced, and pyelitis any sort of an entity?

The print is good, the photographs and index excellent, but many of the line drawings are due for replacement by photographs or for simplification and the illustrations of a steam tent and a typhoid chart must have been in the first edition.

The crucial point, from a nurse's angle, on the quality of a text-book is its usefulness as an aid to the passing of her examinations The last section of this book consists of sample examination questions. The text supplies the answers and therefore should find a ready market wherever paediatric nursing is taught.

F.J.F.